Volume 153 January-June 1978

NATIONAL GEOGRAPHIC

INDEX

January-June 1978

VOLUME 153

PUBLISHED BY THE
NATIONAL GEOGRAPHIC SOCIETY
WASHINGTON, D. C.

NATIONAL GEOGRAPHIC SOCIETY

WASHINGTON, D. C.

Organized "for the increase and diffusion of geographic knowledge"

GILBERT HOVEY GROSVENOR
Editor, 1899-1954; President, 1920-1954
Chairman of the Board, 1954-1966

THE NATIONAL GEOGRAPHIC SOCIETY is chartered in Washington, D. C., in accordance with the laws of the United States, as a nonprofit scientific and educational organization. Since 1890 the Society has supported 1,533 explorations and research projects, adding immeasurably to man's knowledge of earth, sea, and sky. It diffuses this knowledge through its monthly journal, NATIONAL GEOGRAPHIC; its books, globes, atlases, filmstrips, and educational films; *National Geographic WORLD*, a magazine for children age 8 and older; information services; technical reports; exhibits in Explorers Hall; and television.

ROBERT E. DOYLE, President
GILBERT M. GROSVENOR, Vice President
OWEN R. ANDERSON, Vice President and Secretary
HILLEARY F. HOSKINSON, Vice President and Treasurer
WILLIAM T. BELL, FRANK S. DELK,
LEONARD J. GRANT, RAYMOND T. McELLIGOTT, JR.,
C. VERNON SANDERS, EDWIN W. SNIDER
Associate Secretaries

BOARD OF TRUSTEES

MELVIN M. PAYNE, Chairman of the Board
LLOYD H. ELLIOTT, Vice Chairman
President, George Washington University
MELVILLE BELL GROSVENOR, Chairman Emeritus
THOMAS W. McKNEW, Advisory Chairman

FRANK BORMAN, Chairman of the Board and President, Eastern Airlines
J. CARTER BROWN, Director, National Gallery of Art
WARREN E. BURGER
Chief Justice of the United States
ROBERT E. DOYLE, President, National Geographic Society
GEORGE M. ELSEY, President, American National Red Cross
GILBERT M. GROSVENOR
Editor, National Geographic
ARTHUR B. HANSON, General Counsel, National Geographic Society
CARYL P. HASKINS, Former President, Carnegie Institution of Washington
JEROME H. HOLLAND
Former U. S. Ambassador to Sweden
CARLISLE H. HUMELSINE
President, The Colonial Williamsburg Foundation
MRS. LYNDON B. JOHNSON
CURTIS E. LeMAY, Former Chief of Staff, U. S. Air Force
WM. McCHESNEY MARTIN, JR.
Former Chairman, Board of Governors, Federal Reserve System
LAURANCE S. ROCKEFELLER
President, Rockefeller Brothers Fund
ROBERT C. SEAMANS, JR.
Henry R. Luce Professor of Environment and Public Policy, Massachusetts Institute of Technology
FREDERICK G. VOSBURGH
Former Editor, National Geographic
JAMES H. WAKELIN, JR., Former Assistant Secretary of Commerce for Science and Technology
JAMES E. WEBB, Former Administrator, National Aeronautics and Space Administration
CONRAD L. WIRTH, Former Director, National Park Service

Trustees Emeritus

CRAWFORD H. GREENEWALT
JUAN T. TRIPPE
ALEXANDER WETMORE
LOUIS B. WRIGHT

COMMITTEE FOR RESEARCH AND EXPLORATION

MELVIN M. PAYNE, Chairman
EDWIN W. SNIDER, Secretary
ALEXANDER WETMORE, Chairman Emeritus

BARRY C. BISHOP, National Geographic Staff, ROBERT E. DOYLE, GILBERT M. GROSVENOR, MELVILLE BELL GROSVENOR, CARYL P. HASKINS, STERLING B. HENDRICKS, Scientist Emeritus, U. S. Department of Agriculture, THOMAS W. McKNEW, BETTY J. MEGGERS, Research Associate-Anthropology, Smithsonian Institution, T. DALE STEWART, Physical Anthropologist Emeritus, Smithsonian Institution, GEORGE E. STUART, FREDERICK G. VOSBURGH, JAMES H. WAKELIN, JR., GEORGE E. WATSON, Curator of Birds, Smithsonian Institution, FRANK C. WHITMORE, JR., Research Geologist, U. S. Geological Survey, CONRAD L. WIRTH, LOUIS B. WRIGHT, and PAUL A. ZAHL, Former Senior Scientist, National Geographic Staff

ASSISTANT SECRETARIES OF THE SOCIETY: Joseph B. Hogan, James P. Kelly, Adrian L. Loftin, Jr., Lewis P. Lowe, Ward S. Phelps, Cletis Pride

ASSISTANT TREASURER: Alfred J. Hayre. *Assistants to the President:* Earl Corliss, Jr., Richard E. Pearson. *Administrative:* D. Evelyn Carnahan, Janet C. Soper

SECRETARY'S STAFF: *Accounting:* Martha Allen Baggett, Dorothy L. Dameron, Jay H. Givans, Laura L. Leight, William G. McGhee, George E. Newstedt, David H. Peters, James M. Swartz. *Administration:* Ruth E. Clark, Frederick C. Gale, Robert V. Koenig, Zbigniew Jan Lutyk, Joyce S. Sanford, Karen F. Shrewsberry, Frank M. Twigger. *Computer:* James G. Schmelzer. *Educational Services:* Jerome F. Owecke, Carl W. Harmon, Jr. *Employee Benefits:* Howard R. Hudson, Mary L. Whitmore. *Explorers Hall:* Peter Purpura. *Membership Services:* Margaret L. Bassford, Robert C. Dove, Erma T. Goetzinger, William T. McDonnell, Jimmie D. Pridemore, Charles P. Thomas, Paul B. Tylor, Dorothy M. Wagner, Marguerite M. Wise, Peter F. Woods. *Personnel:* Thomas L. Hartman, M.D., Robert E. Howell, Glenn G. Pepperman, Shirley N. Wilson. *Printing:* Joe M. Barlett, Frank S. Oliverio, Wilhelm R. Saake, Hans H. Wegner. *Promotion:* Charles T. Kneeland, Robert J. Warfel, Robert L. Feige, Joseph S. Fowler, Thomas M. Kent, F. William Rath, Towne Windom. *Purchasing:* Robert G. Corey, Thomas L. Fletcher, Sheila H. Immel

ADVERTISING: *Director:* James L. Till, 1251 Avenue of the Americas, New York 10020. *Regional managers—Eastern:* George W. Kellner, New York. *Midwestern:* Robert R. Henn, Chicago. *San Francisco:* Cecil H. London. *Los Angeles:* Richard H. Lehman. *Detroit:* George E. Moffat. *Canada:* Robert W. Horan, New York. *International:* John F. Grant, New York. *Travel:* Gerald A. Van Splinter, New York. *European Director:* Michel A. Boutin, 90 Ave. des Champs-Élysées 75008, Paris. *Business Manager:* Peter W. Michaels. *Asst. to Director:* Blanche Coffey

COPYRIGHT © 1978 National Geographic Society, 17th and M Sts. N.W., Washington, D. C. 20036.

MELVIN M. PAYNE *Chairman of the Board*
ROBERT E. DOYLE *President of the Society*
MELVILLE BELL GROSVENOR *Editor Emeritus*

NATIONAL GEOGRAPHIC MAGAZINE

GILBERT M. GROSVENOR *Editor*

W. E. GARRETT *Associate Editor, Illustrations*
JOSEPH JUDGE *Associate Editor, Text*

SENIOR ASSISTANT EDITORS

James Cerruti, *Free-lance Articles* Robert E. Gilka, *Photography*
William Graves, *Expeditions* Edward J. Linehan, *Manuscripts*
Samuel W. Matthews, *Production* O. Louis Mazzatenta, *Layout*
Howard E. Paine, *Art* Carolyn Bennett Patterson, *Legends*
Thomas R. Smith, *Illustrations* Kenneth F. Weaver, *Science*
Ann K. Wendt, *Research* Herbert S. Wilburn, Jr., *Control Center*

TEXT

ASSISTANT EDITORS: Rowe Findley, Allan C. Fisher, Jr., Robert P. Jordan, Bart McDowell, Elizabeth A. Moize, Merle Severy

SENIOR WRITERS: Thomas J. Abercrombie, David S. Boyer, William S. Ellis, Howard La Fay, John J. Putman, Volkmar Wentzel, Peter T. White

SENIOR EDITORIAL STAFF: Harvey Arden, Kent Britt, Thomas Y. Canby, Mike Edwards, Boyd Gibbons, Rick Gore, Noel Grove, Alice J. Hall, Bryan Hodgson, Ethel A. Starbird, Gordon Young

EDITORIAL STAFF: Robert Booth, John L. Eliot, David Jeffery, Michael E. Long, John L. McIntosh, George E. Stuart, Priit J. Vesilind

RESEARCH: Frances H. Parker (Associate Chief); Carolyn H. Anderson, Susan L. Anderson, Judith Brown, Susan P. Byrnes, Susan Day Fuller, Ann B. Henry, Jan Holderness, Patricia B. Kellogg, Levenia Loder, Jean B. McConville, Carol M. McNamara, Jeanne E. Peters, Lesley B. Rogers, Frances W. Shaffer. *Geographic Information:* Bette Joan Goss. *Style:* Michaeline A. Sweeney. *Legends:* Abigail A. Tipton

ILLUSTRATIONS

PHOTOGRAPHERS: Dean Conger, Joseph J. Scherschel (Assistant Directors); James L. Amos, James P. Blair, Victor R. Boswell, Jr., Jodi Cobb, Bruce Dale, Gordon W. Gahan, David Alan Harvey, Otis Imboden, Emory Kristof, Bianca Lavies, Bates Littlehales, Robert W. Madden, George F. Mobley, Robert S. Oakes, Steve Raymer, Robert F. Sisson *(Natural Science)*, James L. Stanfield. *Administration:* John E. Fletcher, Guy W. Starling

ILLUSTRATIONS EDITORS: W. Allan Royce (Assistant Chief); David L. Arnold, Taylor Gregg, Declan Haun, H. Edward Kim *(Layout)*, Charlene Murphy, Robert S. Patton, Andrew Poggenpohl, Elie S. Rogers, Jon Schneeberger, Mary Griswold Smith *(Research Projects)*. *Picture Editor:* Bruce A. McElfresh

ART: William N. Palmstrom (Chief); Walter Q. Crowe, John D. Garst, Jr. (Assistant Chiefs). *Artists:* Lisa Biganzoli, William H. Bond, John W. Lothers, Robert C. Magis, Jaime Quintero, Ned M. Seidler. *Cartographic Artist:* Snejinka Stefanoff. *Map Editor:* John T. Blozis. *Research:* Virginia L. Baza, Harold A. Hanson, Dorothy A. Nicholson. *Production:* Isaac Ortiz (Supervisor); Iskandar Baday, Elie Sabban, Alfred L. Zebarth, Leo B. Zebarth

DESIGN: Charles C. Uhl, Robert E. Pullman, Betty A. Clayman

ENGRAVING AND PRINTING: Dee J. Andella (Director); William W. Smith (Assistant Director); John T. Dunn, John R. Metcalfe, James R. Whitney

CARTOGRAPHY

Richard K. Rogers (Assistant Chief); Margery K. Barkdull, Charles F. Case, Ted Dachtera, Richard J. Darley, John F. Dorr, Russel G. Fritz, Charles W. Gotthardt, Jr., Thomas L. Gray, Catherine M. Hart, Donald A. Jaeger, Harry D. Kauhane, Mary Anne McAleer, Charles L. Miller, Robert W. Northrop, John F. Shupe, Charles L. Stern, Douglas A. Strobel, Tibor G. Toth, Thomas A. Wall, Thomas A. Walsh, Charles M. Wilson III

EDITORIAL SERVICES

ADMINISTRATION: Joyce W. McKean (Asst. to the Editor), Elaine R. Chisman, Lilian Davidson, Virginia H. Finnegan, Mary F. Klemann, Lucille L. McInerney, Winifred M. Myers, Shirley Neff, Barbara A. Shattuck, M. Jean Vile. *Correspondence:* Carolyn F. Clewell, Eileen W. Bowering, Clifford R. DuBois. *Indexes:* Jolene M. Blozis

PHOTOGRAPHIC LABORATORIES AND TYPESETTING: Carl M. Shrader (Chief); Milton A. Ford (Associate Chief); Lawrence F. Ludwig (Assistant Chief); Herbert Altemus, Jr., David H. Chisman, Ellwood M. Kohler, Jr., Geoffrey T. McConnell, William S. Petrini, Claude E. Petrone, Joan S. Simms (Assistant)

LIBRARIES: *Publications:* Virginia Carter Hills (Librarian); Patricia Murphy Smith, Carolyn Locke, Louise A. Robinson, Marta Strada. *Illustrations:* L. Fern Dame, Carolyn J. Harrison. *Records:* Lorie Northrop, Mary Anne McMillen. *Films:* Betty G. Kotcher

RELATED EDUCATIONAL SERVICES OF THE SOCIETY

SENIOR ASSISTANT EDITORS

Jules B. Billard, *Book Service*
Robert L. Breeden, *Special Publications and School Services*

BOOK SERVICE: Thomas B. Allen, Seymour L. Fishbein (Associate Chiefs); Ross Bennett, Constance Brown, Mary H. Dickinson, Robert C. Firestone, Mary Swain Hoover, Charles O. Hyman, Anne Dirkes Kobor, J. Edward Lanouette, Carol Bittig Lutyk, David F. Robinson, Shirley Scott, Margaret Sedeen, Verla Lee Smith

SPECIAL PUBLICATIONS AND SCHOOL SERVICES: Donald J. Crump (Associate Chief); Philip B. Silcott (Assistant Chief); William L. Allen, Jody Bolt, Toni Eugene, Ronald Fisher, William R. Gray, Sallie M. Greenwood, Mary Ann Harrell, Suzanne J. Jacobson, Geraldine Linder, Tee Loftin, Louisa V. Magzanian, Tom Melham, Robert Messer, Jennifer C. Urquhart, Ursula Perrin Vosseler, George V. White, Merrill Windsor. *National Geographic WORLD:* Ralph Gray (Editor); Charles H. Sloan (Associate Editor); Ellen Joan Hurst, Margaret McKelway, Pat Robbins, Eleanor Shannahan, Veronica Smith. *Books for Young Explorers:* Cynthia Ramsay. *Filmstrips:* Jimmie Abercrombie, James B. Caffrey, Margery G. Dunn, Jacqueline Geschickter, Jane R. McCauley, H. Robert Morrison, George Peterson, Judith E. Rinard, Joan Ann Straker

NEWS SERVICE: Paul Sampson (Chief); Donald J. Frederick, William J. O'Neill, Robert C. Radcliffe. **TELEVISION AND EDUCATIONAL FILMS:** Dennis B. Kane (Chief); Marjorie M. Moomey *(Research)*; Patricia F. Northrop *(Promotion)*; Sidney Platt *(Educational Projects)*; Yeorgos N. Lampathakis, Carl E. Ziebe. **LECTURES:** Joanne M. Hess (Chief); Robert G. Fleegal, Mary W. McKinney, Gerald L. Wiley. **RECORDINGS:** John M. Lavery (Chief). **AUDIOVISUAL:** Jon H. Larimore

Contents

Page

JANUARY 1978

EDITOR'S PAGE 1
THE CITY AROUND RED SQUARE: MOSCOW 2
By John J. Putman, with photographs by Gordon W. Gahan
IMPERIAL RUSSIA'S GLITTERING LEGACY 24
Photographs of treasures displayed in the Kremlin Armory
ZULU KING WEDS A SWAZI PRINCESS 47
Text and photographs by Volkmar Wentzel
THE HUDSON: "THAT RIVER'S ALIVE" 62
By Alice J. Hall, with photographs by Ted Spiegel (Black Star)
Map supplement included—*Close-up: U.S.A., New York, New Jersey, and Pennsylvania*
A BAD TIME TO BE A CROCODILE 90
By Rick Gore, with photographs by Jonathan Blair
NEW ZEALAND'S MILFORD TRACK: "WALK OF A LIFETIME" 117
By Carolyn Bennett Patterson, with photographs by Robert E. Gilka
THE FLIGHT OF THE *GOSSAMER CONDOR* 130
By Michael E. Long

FEBRUARY 1978

EDITOR'S PAGE 141
MINOANS AND MYCENAEANS: GREECE'S BRILLIANT BRONZE AGE 142
By Joseph Judge, with photographs by Gordon W. Gahan and paintings by Lloyd K. Townsend
OUR BALD EAGLE: FREEDOM'S SYMBOL SURVIVES 186
By Thomas C. Dunstan, with photographs by Jeff Foott
THE GULF'S WORKADAY WATERWAY 200
By Gordon Young, with photographs by Charles O'Rear
THE LIVING DEAD SEA 225
By Harvey Arden, with photographs by Nathan Benn
BRAZIL'S GOLDEN BEACHHEAD 246
By Bart McDowell, with photographs by Nicholas deVore III
THE PANAMA CANAL TODAY 279
By Bart McDowell, with photographs by George F. Mobley

MARCH 1978

EDITOR'S PAGE 295
SPAIN: IT'S A CHANGED COUNTRY 297
By Peter T. White, with photographs by David Alan Harvey
LADAKH –THE LAST SHANGRI-LA 332
Article and photographs by Thomas J. Abercrombie
THE WONDROUS EYES OF SCIENCE 360
By Rick Gore, with photographs by James P. Blair
THE FOUR-EYED FISH SEES ALL 390
Picture story by Paul A. Zahl, with text by Thomas O'Neill
EASYGOING, HARDWORKING ARKANSAS 396
By Boyd Gibbons, with photographs by Matt Bradley
THE THOUSAND-MILE GLIDE 431
By Karl Striedieck, with photographs by Otis Imboden

Page

APRIL 1978

EDITOR'S PAGE 439
CHINA'S INCREDIBLE FIND 440
By Audrey Topping, with paintings by Yang Hsien-Min
The first emperor's army
CHICAGO! 463
By Harvey Arden, with photographs by Steve Raymer
THE CONTINENTAL SHELF: MAN'S NEW FRONTIER 495
By Luis Marden, with photographs by Ira Block
TERMITES: DWELLERS IN THE DARK 532
Article and photographs by Glenn D. Prestwich
YUKON FEVER: CALL OF THE NORTH 548
By Robert Booth, with photographs by George F. Mobley
Map supplement included—*Close-up: Canada, British Columbia, Alberta, and the Yukon Territory*

MAY 1978

EDITOR'S PAGE 579
ALONE ACROSS THE OUTBACK 581
By Robyn Davidson, with photographs by Rick Smolan (Contact Press Images)
MEXICO: "A VERY BEAUTIFUL CHALLENGE" 612
By Mike Edwards, with photographs by Thomas Nebbia
MEXICAN FOLK ART 648
By Fernando Horcasitas, with photographs by David Hiser
HAWAII'S FAR-FLUNG WILDLIFE PARADISE 670
By John L. Eliot, with photographs by Jonathan Blair
THERE'S MORE TO NASHVILLE THAN MUSIC 692
By Michael Kernan, with photographs by Jodi Cobb
TULIPS: HOLLAND'S BEAUTIFUL BUSINESS 712
By Elizabeth A. Moize, with photographs by Farrell Grehan

JUNE 1978

EDITOR'S PAGE 729
PENNSYLVANIA: FAIRE LAND OF WILLIAM PENN 731
By Gordon Young, with photographs by Cary Wolinsky (Stock, Boston)
GLASS TREASURE FROM THE AEGEAN 768
By George F. Bass, with photographs by Jonathan Blair
LIVING THE GOOD LIFE IN BURGUNDY 794
By William Davenport, with photographs by Robert Freson
OF AIR AND SPACE 819
By Michael Collins
PORTFOLIO 825
Photographs by Nathan Benn, Robert S. Oakes, and Joseph D. Lavenburg, with text by Michael E. Long
An introduction to the National Air and Space Museum of the Smithsonian Institution
DRAGONS OF THE DEEP 838
Picture story by Paul A. Zahl
THE PROUD ARMENIANS 846
By Robert Paul Jordan, with photographs by Harry N. Naltchayan
ANNOUNCING A NEW FOUR-BOOK SERIES OF SPECIAL PUBLICATIONS .. 874A
The Ocean Realm; Into the Wilderness; America's Sunset Coast; Mysteries of the Ancient World

Index VOLUME 153 JANUARY-JUNE 1978

January	pp.	1-140	April	pp.	439-578
February	pp.	141-294	May	pp.	579-728
March	pp.	295-438	June	pp.	729-874

Titles and illustrations in bold face

A

Aalsmeer, Netherlands: Tulip auction **722**
Abel, Rudolf 834
Abercrombie, Thomas J.: ***Ladakh: The Last Shangri-la.*** Mar., 332-359
Aborigines, Australian 92, 582, 583, 584-585, 586, 590, **590-591,** 595, 597, 600, **601,** 602; Totems 96, **97**
Abrams, Hy **470**
Abt, Helmut 372
Acapulco, Mexico 633, 635, **645**
Achirik (village), Ladakh 335, 338; Household 335, **340-341**
Achirik Pass, Ladakh: Trek over 332-333, **332-333,** 335
Acoustic holography **375**
Acuff, Roy 694
Adirondack Park, N. Y. **65**
Aedui (Celtic tribe) 810
Aegean Sea and region: ***Glass Treasure From the Aegean.*** By George F. Bass. June, 768-793; ***Minoans and Mycenaeans: Greece's Brilliant Bronze Age.*** By Joseph Judge. Feb., 142-185
Aerial photography: Uses 376
Aerodrome No. 5 (aircraft) 819
Aeronautics *see Gossamer Condor;* National Air and Space Museum; Soaring
Africa: ***African Termites, Dwellers in the Dark.*** By Glenn D. Prestwich. Apr., 532-547; Crocodiles **90-95,** 91, 96, **100-107,** 102, 108, 111; ***Zulu King Weds a Swazi Princess.*** By Volkmar Wentzel. Jan., 47-61
Agajanian, Tim **857**
Agamemnon 143, 148, 149, 151, 181; "Mask of" **142-143,** 151
Agriculture: Hydroponics 867; Israel 233, 238, crops **232-233;** Reclamation **868-869;** Soil desalination 233, 245; *see also* Farmers and farming
Ain (department), France 795, 799
Aircraft: Manpowered 134, **134-135,** 135 *see also Gossamer Condor;* Plant **405;** World War II 222, **832-833;** *see also* National Air and Space Museum; Sailplanes
Akrotiri (ancient village), Thera 163, 180; Frescoes **157-159, 161,** 163, 180; Painting of **163**
Aksai Chin region, Ladakh: Chinese seizure of (1962) 335, 349
Alabama: Gulf Coast 208-209, **209**
Alaska: Oil, offshore 524; *see also* Bald eagle
Alaska, Gulf of 493, 502, 524
Alaska Highway: Yukon Territory **551,** 559
Albacete, Spain 300
Albany, N. Y. 67; State offices **75**
Albert Einstein Spacearium 823
Alberta, Canada: ***Beauty to Flaunt and Bounty to Grow on.*** Apr., supplement
Alcalá de Henares, Spain 320
Alcázar, Toledo, Spain **326**
Alchi village, Ladakh **351,** 353
Aldrich, Winthrop 84-85
Aldrin, Edwin E., Jr. 836
Alejo López, Francisco Javier 625
Alert (Coast Guard cutter) 518
Alexander, Marshall **512**
Alexander Nevsky 30
Alexatos, Dartanion L. 766
Alexis, Tsar (Russia): Orb **30**
Alexis Nikolaevich: Portrait **25**
Alfonso XIII, King (Spain) 322
Algae: Fossils **608;** Halophilic 233; Hudson River 67, 88
Alhambra (fortress), Granada, Spain 307
Ali, Muhammad 484
Alice Springs, Australia 582, 583, 590, 600
Aliquippa, Pa.: Steel plant **744-745**
Allegheny (river), Pa. 736, **756-757**
Allegheny Portage Railroad 752
Allen, Bryan 130, **131, 137,** 139, **140**
Alligators: ***A Bad Time to Be a Crocodile.*** By Rick Gore. Jan., 90-115
Allison, Joe 694
Almansa, Spain **298-299**
Alone Across the Outback. By Robyn Davidson. May, 581-611
Alpözen, Oğuz 770, 774, 786, 792
Alvarez, Luis W. **376**
Amara, Lucine **857**
American Federation of Musicians: Nashville members 699, 710
American Petroleum Institute 507, 514
American Revolution 735, 754
Americana, Brazil 256
Ameyaltepec, Mexico 657, 661
Amish (people) 754, 756-757, **764-765,** 765
Amphorae, Byzantine Greek 770, 775, 777, 780, **785,** 786, 792
Anatomy, human: Biostereometrics **363, 365,** 376-377, internal organs studies **372,** 377, 379; Brain: CT scan 377, computer image **374-375,** 383, nerve-cell membranes 364, **373**
Anchovies, bay 63, **67**
Andalusia (region), Spain 306-307
Anderson, William **127**
Andrews, Dick 281, 287, 290, 293, 294; Daughter 288; Wife 287-288
Andros Castle (freighter) 279
Aneshansley, Daniel 384
Angeles, Victoria de los 323
Angra dos Reis, Brazil: Housing **260-261;** Nuclear plant 251, 257, **260**
Animal behavior: Frigatebird 679; *see also* Termites
Animal eyes *see* Four-eyed fish
Animal introduction: Canal Zone manatees 294; Laysan Island rabbits 672
Animals: Endangered species *see* Bald eagle; Crocodilians
Animals: Tagged and monitored: Crocodile **96,** sturgeon 74, *see also* Bald eagle: Study of
Anjar, Lebanon **868-869**
Ann-Margret (actress) **700**
Antarctic waters: Krill 524
Anthracite coal 731, 737, 738, 740
Anthropology: Photography 383
Antonucci, Ray 479-480
Antúnez Torres, Edmundo 633
Apollo missions: Astronauts' body volume 365, 377; Exhibit 823, **837;** Lunar mapping 385; Spacecraft: Command module **818, 819**
Aprahamian, Berge 873
Aquiculture: Arkansas 402, **410;** Continental shelf **499-500,** 501, 524, 527, **527-529**
Arab immigrants: Brazil 256
Aransas National Wildlife Refuge, Texas 220, 222
Ararat, Mount, Turkey **848-849,** 852, 854
Arbatov, Georgy 20
Archangel Cathedral, Moscow **5**
Archeology: ***China's Incredible Find.*** By Audrey Topping. Apr., 440-459; Cosmic-ray study 376; ***Minoans and Mycenaeans: Greece's Brilliant Bronze Age.*** By Joseph Judge. Feb., 142-185; Photography 369, 376
Archeology, underwater 729; ***Glass Treasure From the Aegean.*** By George F. Bass. June, 768-793
Architecture: France: Medieval period **799,** 803, 806, **807,** Romanesque 806; *see also* Chicago, Ill.; Nashville, Tenn.
Arctic Region: Indians **556-557,** 559-561, 564-565, 570
Arden, Harvey: ***Chicago!*** Apr., 463-493; ***The Living Dead Sea.*** Feb., 225-245

Arevian, Sanam **864, 865**
Argo Merchant (tanker): Oil spill **516-517**
Argonne National Laboratory, Lemont, Ill. 375, 379
Arkansas: ***Easygoing, Hardworking Arkansas.*** By Boyd Gibbons. Mar., 396-427
Aquafarms 402, **410**
Capital *see* Little Rock
Character of people 396, 398, 399, 413, 415, 420
Culture 398, **405,** 413
Facts and figures 403
Farmers and farming 396, 398, **398,** 399, **400-401,** 402, 403, **407,** 409-410, 417, 419, 423
Fishermen 407-409, 413, **427**
Flag **403**
Governor: Former *see* Faubus, Orval; Present *see* Pryor, David
History 399, 419, 420; Economic 405, 413, 415; 417, 423
Industry 403, **405,** 408-409, 415, **416-417,** 420, 423
Map 402-403
Newcomers **397, 412,** 413, 420, 423, 426
Population 403, 415
Racial situation 405, 410, 413
Sportsmen 402, 403, **404,** 407-409, **408, 411,** 413, **427**
Tourists 403, 415, 423
Wildlife 402, 410, 423
Arkansas Arts Center, Little Rock 398, 405; Children's Theater **405**
Arkansas Bass Association: Tournament 407-408
Arkansas Industrial Development Commission (AIDC) 415
Arkansas River, and valley, U. S. 396, 399, 402, 403, 407, **408-409,** 413
Arkansas Symphony Orchestra 398, 413
Arkhanes, Crete: Tombs, ancient 150, 164, 166
Armenian Apostolic Church: ***The Proud Armenians.*** By Robert Paul Jordan. June, 846-873
Baptism rate: Soviet Armenia 864, 873
Churches (active; inactive) 846-847, **848-850,** 851, 854, 858, 861, 864, **864-865, 867,** 872-873
Clergy 846-847, 851, 854, **866,** 872, 873
Ecclesiastical enclaves **858-859,** 873
Founder; patron saint **849,** 873
Holy chrism **866;** Urn **866**
Mekhitarist Order: Schools **858-859, 870**
Rituals 847, **849,** 851, 854, 861, **864-866, 867,** 872
Seminaries **858-859,** 873
Supreme Patriarch **866,** 872, 873
Worship services 847, 851, 873
Armenian General Benevolent Union 858, 861
Armenians: ***The Proud Armenians.*** By Robert Paul Jordan. June, 846-873
Agricultural accomplishments 861, 867, **868-869**
The arts, contributions to 861; Notables **856, 857,** 858, 861, **863**
Attributes 851, 853, 861, 873
Business and professional success 851, 853, 861, 870, 873; Notables 853, **856, 857,** 858, 861-862
Christian faith 846, 847, 851, 853, 864, 872 *see also* Armenian Apostolic Church, *outlined*
Dispersion 846, 849, 851, 852-853, 867, 869, 870, 873
Ethnic identity retained 851, 854, 856, 858, 861, 873
Ethnic origin 851
History, political 846, 849, 851, 852-853, 862, 869; Border changes: Map 852
In Lebanon 869, **870, 871,** 873; Monument **872;** Town founded by **868-869**
In Soviet Armenia **846-847,** 849, 852, 853, **860-861,** 862, 863, **863-867,** 867, 869, 872-873
In Turkey: Massacre and deportation: World War I 849, 851, 852-853, 862; Present-day citizens 846, 847, 849, **850,** 851, 853, discrimination against 851, persecution of, continued 847, 851
In United States **847,** 853, **854-857,** 858, 861-862, 869, 872, 873
Monuments 852, 872, **872**
Schools 858, **870;** Seminaries **858-859,** 873
Technological accomplishments 867
Armstrong, Neil 823, 828, 836
Arnold, Henry H. 828
Arson: Chicago, Ill. 480
Arts and crafts: Miniature artwork **661, 863;** *see also* Glass, Islamic; Mexican folk art
Asia: ***The Proud Armenians.*** By Robert Paul Jordan. June, 846-873; *see also* China, People's Republic of; Israel; Jordan; Ladakh
Aşkın, Mehmet 768, 770
Assassinations, terrorist 851
Assumption Cathedral, Moscow **6;** Interior **28, 29**
Astor, William 84
Astronomy: Photography 368, **369,** 372, computer applications **361-362,** 364
Asturias (region), Spain 322-323
Atchafalaya River, La. 219
Atkins, Chet **710**
Atkins Pickle Company, Ark. **416**
Atlantic continental shelf, U. S.: ***The Continental Shelf: Man's New Frontier.*** By Luis Marden. Apr., 495-531
Atlantic Richfield Company: Aquiculture experiment **499-500,** 501
Atlantis (legendary island) 180
Atom: Behavior of 380
Auctions: Alligator hides 97, 108, 111-112; Amish horse auction **764-765;** Arkansas 396, 398, **398-399,** 399, 407, 409; Tulips **722;** Wine 815, 816
Aungst, John W., Jr. 760
Australia: Crocodiles 91, 92, **95,** 96, **96;** Sea dragons 839, 845; *see also* Camel trip
Australian Flying Doctor Service radio 586, **601**
Autogiro, man-powered **134**
Automobiles: Brazil 257; Junked **72-73;** Mexico **613;** Pennsylvania 746; Spain 305, 317; U.S.S.R. 7, **17,** 20
Avery Island, La.: Tabasco sauce production **211**
Aviation *see Gossamer Condor;* National Air and Space Museum; Soaring
Avilés, Spain: Steelmaking 323
Ax, double: Minoan **165,** 172, 175
Ayala, Dámaso **669;** Family 667
Ayers Rock, Australia **588,** 589
Aynard, Hubert 806, 808-809
Aztecs: Mexico 623, 638, 657, 669

B

B-17 (aircraft): Painting of **832-833**
Bach, Ira 481, 483
Back Gate, Ark. 396, 398, 399
Bacterium, Dead Sea: Purple-pigment yield, uses for 230, 233
A Bad Time to Be a Crocodile. By Rick Gore. Jan., 90-115
Bahia Mar (condominiums), Padre Island, Texas **221**
Baker, Robert and Caleb 760
Balboa, Vasco Núñez de 279-280
Balboa Heights, C. Z. 290
Bald eagle: ***Our Bald Eagle: Freedom's Symbol Survives.*** By Thomas C. Dunstan. Feb., 186-199
Behavior 188
Captive breeding program 199
Diet 187, 190, 191, 193, 196, 197, 198, 199; Carrion eater 196, **197,** dead fish 193, 197, 198, 199, hunter kills 196; Livestock predation, unproven 196, 197
Distribution 190
Endangered species: Official status 190
Fall gatherings **196-198,** 199
Fledglings 193, 196; Weight 193
Hazards 187, 190-191, 198, 199; Bounty hunting (pre-1952) 197
Juveniles **188,** 196, 198
Markings 188, **188-189**
Measurements 190
Migration 187, 196, 197, 198; Distance covered 198; Unknown factors 199
Nesting sites 190, 191, 194; Loss

of 191; Nests 187 **190,** 191, **192-195,** weight 195
Nestlings **190,** 191, **191,** 193, **193;** Weight 191
Population 190, 197; Decline in, reasons for 190-191, 199; Stabilizing, production figure needed for 193
Predator reputation, undeserved 196, 197
Preservations, winter-roost 198
Range 190, 198
Southern species 190; Range 190
Species (U. S.) 190
Study of 190, **190,** 191, **191,** 193, 196, 198; Tracking: Banding 191, 193, 198, 199, radio 191, 193, 196, 198
Subadults **188-189**
Threatened species 187, 190-191, 199
Wintering 187, 196, 198, 199
Bald Eagle Mountain, Pa. 431; Sailplane-flight route **428-430, 432, 438**
Balearic Islands, Spain 303, 315
Ballet: Moscow 16, 38, 44, **45,** cover ill.
Ballooning: National Air and Space Museum 822, 823; Philadelphia, Pa. **739**
Baltimore Canyon, Atlantic Ocean: Oil leases 498, 507, 510
Bangú, Rio de Janeiro 269, 276
Banks, Ernie **485**
Barcelona, Spain 303, 315-316
Bard College, Annandale, N. Y.: Marsh conference 88
Bardi, Pietro Maria **274**
Barges: Arkansas 402, 407, 409; Hudson River: Wreck **84;** *see also* Gulf Intracoastal Waterway
Bark paper: Ladakh **345,** 353; Mexico 657, 661, painting **657,** ritual use **656, 657,** 663
Barley meal: Ladakh 338, 340
Barrett, George 704
Barro Colorado (island), C. Z. 282, 288, 292
Barter: Mexico 658
Baseball: Chicago, Ill. 485, 492
Baseball's Hall of Fame: Member: **485**
Basketball: New Orleans, La. 214
Basque Provinces, Spain 303, 307
Basques: Separatist movement 303, 308, 312, 315; Spain 303, 308-309, **330-331**
Bass, George F. 729, **773;** ***Glass Treasure From the Aegean.*** June, 768-793
Bass 64, **66, 67,** 77, 407-408, 409
Bates, Michael 792
Bateson, George 383
Bauxite: Arkansas 403, 407
Bayous: Gulf Coast, U. S. 200, **206-207,** 218
Bazaar: Leh, Ladakh 342, 347, 349
Beacon, N. Y. 67; Park 69
Beaubier, Hiram 574
Beaune, France 815; Hospital 815, benefit **814-815,** 815-816
Beauty contest: "Little Miss Pink Tomato" **424-425**
Bedford, Pa. 433, 435, 436
Beer: Mexico 639, 641, 644
Behind the Headlines: The Panama Canal Today. By Bart McDowell. Feb., 279-294
Beirut, Lebanon: Armenians 853, 870, **870, 871,** 873; War damage 853, **870,** 873
Bell Tower of Ivan the Great, Moscow **5, 6**
Bellow, Saul 469, 471, 473
Belt looms: Mexico **654-655,** 661
Benckenstein, Ellis and Brenda 112
Bends (aeroembolism) 774, 777, 786-787
Benidorm, Spain 300, 301, **304, 305**
Benn, Nathan, photographer: ***The Living Dead Sea.*** Feb., 225-245; Portfolio (National Air and Space Museum). June, 825-837
Benton, Ark. 407, 409
Berberian, Haig 853
Berman, Cindy 426
Bermeo, Spain: Basques **330-331**
Bernard of Clairvaux, Saint 806, 809, 812
Beryozka stores, Moscow 34
Berzé la Ville, France: Vineyards near **800-801**
Betelgeuse (star) **361-362,** 364
Bethlehem Steel, Johnstown, Pa.: Layoffs 766
Beuvray, Mont, France 810
Bible publishing: Nashville, Tenn. 706, **706**
Biblical history: Dead Sea region 228, 233, 239, 241, 243, 245
Bibracte (ancient town), Gaul 810
Bicycles: Custom-built **140;** Tandem **216**
Bifocal fish *see* Four-eyed fish
Bilandic, Michael A. **466,** 486-487, 490; Wife **466**
Bilbao, Spain 308
Biostereometrics 364-365, 376-377
Bird in Hand, Pa. 754
Birds: Bellbird **120,** 127; Blackbirds 410; Ducks 216, 402, 410; Emu **605;** Fantails 121; Galah cockatoo **605;** Goliath heron **107;** Great snowy egret **218-219;** Griffon vulture 322; ***Hawaii's Far-flung Wildlife Paradise.*** By John L. Eliot. May, 670-691; Kea **120,** 121; Roseate spoonbill **218-219;** Takahe 117; Weka **120,** 121; Whooping crane 220, 222; *see also* Bald eagle
Birger, Abram 9
Birotte, Angèle **817**
Birth-control programs: Mexico 636, 640
Biryusinsky (Soviet trawler) 518
Bizarre Dragons of the Sea. By Paul A. Zahl. June, 838-845
Bize-Leroy, Lalou 815
Bjarnason, Matthias 523
Black, Martha Louise 553
Black Horse Hill, China 448
Black Muslims 484-485
Black ware (pottery): Mexico **651**
Blackmon, Eddie 396, 399
Blackmon, Tom 396, 398, **399,** 407
Blacks: Arkansas **407,** 409-410, 413; Chicago, Ill. **465, 478,** 484-485, **485-487;** Nashville, Tenn. **695,** 699, 706-707, **708-709,** 709; Panama 289, **289**
Blair, James P., photographer: ***The Wondrous Eyes of Science.*** Mar., 360-389
Blair, Jonathan, photographer: ***A Bad Time to Be a Crocodile.*** Jan., 90-115; ***Glass Treasure From the Aegean.*** June, 768-793; ***Hawaii's Far-flung Wildlife Paradise.*** May, 670-691
Blair String Quartet: Nashville, Tenn. **705**
Blanchard Springs Caverns, Ark. **422**
Blanco, Teodora: Figurine by **658**
Block, Ira, photographer: ***The Continental Shelf: Man's New Frontier.*** Apr. 495-531
Blue Angels (aerobatic team) 208, **830-831**
Bluefin tuna **528-529**
Boats: Auction 409; Chicago harbor **477;** Fishing **62-63, 70,** 407; Gulf Coast 201, **202-203,** 204, 219, **220-221;** Hudson River 72, 88, regatta **89;** Netherlands **717**
Bolshevik Revolution 28
Bolshoi Theater, Moscow **6,** 16, 40; Ballerina 38, 44, **45,** cover ill.
Bonanza (creek), Yukon 558
Bond, George 527
Books, NGS: Special Publications: *The Ocean Realm, Into the Wilderness, America's Sunset Coast, Mysteries of the Ancient World* 874A-874E; *Research Reports* 1969 294
Booth, Robert: ***Yukon Fever: Call of the North.*** Apr., 548-578
Bordeaux wine 814
Bourg en Bresse, France: Market 799, 802, **802**
Bowen Falls, New Zealand 127, **129**
Boy Scouts: Canal Zone **288,** 290; Jamboree (1977) **746-747**
Boyce Thompson Institute, Yonkers, N. Y.: Hudson River study 63
Boyd, Harriet 175, 178
Boyle, Richard J. 736
Bradley, Matt, photographer: ***Easygoing, Hardworking Arkansas.*** Mar., 396-427
Bradley family farm, Yukon **566-567,** 571, 574
Bravo Betancourt, Hanna 638-639
Brazil: ***Brazil's Golden Beachhead.*** By Bart McDowell. Feb., 246-277; Four-eyed fish **394-395**
Brazilwood 273
Brerau, Lenny **711**
Brethren (religious sect): Pennsylvania 757, 765
Brezhnev, Leonid **17,** 40
Bride-price: Swazis 48

Bridgeport (neighborhood), Chicago, Ill. 486; Tavern 485, **489**
Bridges: Hudson River **62-63, 80, 82-83;** Swinging: Milford Track, New Zealand **116,** 121, 124, 129
Brill, Robert 787, 792
British Columbia, Canada: ***Beauty to Flaunt and Bounty to Grow on.*** Apr. supplement
Bromine: Israel 228; Processing plant **229**
Bronze Age: ***Minoans and Mycenaeans: Greece's Brilliant Bronze Age.*** By Joseph Judge. Feb., 142-185
Brooks, Gwendolyn 484
Brown, "O. D." **559**
Brownell, Russell 219
Bruinsma, Oebele 534, 535, 538
Bubble chambers 367, 381; Tracks **366, 369,** 381
Budant, Alfredo Jorge 267
Buddha 354; In art 342, **344**
Buddhism *see* Tibetan Buddhism
Bui, Thieu **412**
Bulb Research Laboratory, Lisse, Netherlands: Technician **727**
Bull cult: Minoan civilization 164, 166, 172, myth 150-151, 164, sacrifice **164-165**
Bull leaping: Minoan sport 146, 160, 164, **168-169**
Bull rider: Louisiana rodeo **205**
Bullfighters: Spain 306, **320, 321,** 327
Bullrun Creek, Tenn.: Railroad bridge **434,** 435-436
Bultaco motorcycles 315, **316, 317**
Bultó, Francisco **317**
Bumper stickers: Farming slogans 396, **398**
Burger, Warren E. 822, 823
Burgundy (region), France: ***Living the Good Life in Burgundy.*** By William Davenport. June, 794-817
  Architecture **799,** 806, **807, 813**
  Churches 795, 806, 810, 812, **813**
  Cuisine 799, 803, 809, **810, 811, 814-815**
  Farms and farming 799, **800-801,** 802, 816, **817**
  History 795, 798, 799, 801, 803, 806, 809, 810, 812, 816
  Livestock 796, 799, 802, **802,** 804, 805
  Map 798
  Markets 796, 799, 802, **802;** Café **804-805**
  Monasticism 794-795, 806, modern 810, 812; Monasteries 806, 808-809
  Vineyards **794-795,** 796, **800-801,** 812, 814-815; Vintners **796, 815,** number 812; Workers **794-795, 797**
  Wine industry 796, 798, 812, 814, 815, 816
Burial sites: Ancient Egypt: Crocodiles 97, 102; Mycenaean 141, 151, 182, 184, **185;** *see also* Tombs
Burials, live: Ancient China 448, 451, 453, 457, 459
Burian, Rudy 575
Burma: Crocodiles 96
Busch company, Chicago, Ill. 470
Bustard, Robert 98, 100, 114
Buthelezi, Gatsha 59; Family **59**
Byzantine artifacts 770, **785,** 788, 790, 792

C

Cabot, John 515
Cáceres, Spain 327, 330
Cádiz, Spain 305; Cortes of (1812) 306
Caesar, Julius 798, 803, 810
Caetano de Salles, Dona Teresa 261-262
Caimans: South America 94, 95, 97
Cajuns: Louisiana 209, 210
Calabash: Swazi-Zulu wedding **50**
Calcasieu Parish, La. 112
Calder, Alexander: Sculpture by 469, **475**
Caley, Fred 578
California: Aquiculture **499-500;** Armenians 853, 854, **856, 857,** 858, 861-862, 872; Kelp beds **526;** Oil, offshore 501, 524
California Marine Associates: Aquiculture experiment **499-500**
Calumet River, and region, Ill.–Ind. 473-474, **490-491**
Calvo Solano, Pascuala **654**
Camariñas, Spain 326
Camel trip: ***Alone Across the Outback.*** By Robyn Davidson. May, 581-611
Cameron, La. 202, 212
Camouflage *see* Sea dragons
Campbell, Howard 98
Campbell, Robert 570, 571
Campbell, Will 706
Campos, Candido Malta 257
Canada: Bald eagle 190, 191, 198; Eagles 188; *see also* Yukon Territory
Canada–United States: Border 579; Institute on: U.S.S.R. 20; International park 572; Pipeline negotiations 559
Canal Zone 141; ***The Panama Canal Today.*** By Bart McDowell. Feb., 279-294
  Boundary 282, 283
  Dam 283
  Governor **288,** 290; Former 289
  Integration 289-290
  Map 282-283
  Mosquito control 293-294
  Population 287, 288
  Treaties 279, 280, 283, 288; Cost of 280; 1903 treaty 280, 283; Ratification 279, 283, 288
  Width 280
  see also Panama Canal
Canales, Arnulfo 641
Canals: Gulf Intracoastal Waterway 200, 201, 218, 219; Illinois 474, 479; Pennsylvania 749, 752; *see also* Panama Canal
Cancer research: PCB's 81
Cancún Island, Mexico **644**
Canelos, Alejandro 627-628
Cannibalism, animal: Crocodilians 101, 108, 114; Frigatebirds 679; Termites **537**
Canning Stock Route, Australia 605, 606-608
Cannon, Sarah 696, **700**
Canoes 748-749, **762-763**
Cantabrian Mountains, Spain 308; Picos de Europa **310-311,** 322
Cantareira, Brazil 261
Capacitors: PCB's 76, 77
Cape Cod, Mass.: Landsat image **370**
Capileira, Spain 307
Caple, Greg 571
Caravan trade: Himalayas (pre-1949) 335, 337, 342, 346-347; Routes 346-347, map 335
Carcross, Yukon 558
Cárdenas, Lázaro 625, 647
Carew, Karen **366**
Carlisle, Ark.: Catfish farm near 402
Carmack, George 558
Carnival *see* Rio de Janeiro
Carp 64, **67, 230,** 413
Carrabelle, Fla. 203-204
Carriage, 16th-century: Axle **31**
Carrillo, Santiago 322
Carrion eaters: Bald eagle 196, **197,** dead fish 193, 197, 198, 199; Griffon vulture 322
Carson Pirie Scott building, Chicago, Ill.: Ironwork **481**
Carter, Jimmy 208, 251, 405
Carter, William A. 289-290
Cartography: Aerial photography 376; Gamma rays, use of 368, 385; Gravity, mapping of 385; Landsat images 367
Casals, Pablo 323
Casks, handcrafted 342, **352**
Cassils, John 786
Cassock, Russian 15th-century **32**
Castile (region), Spain 300, 320-322; Food 307
Castile, Kingdom of: Pre-eminence of 303, 307
Castilian (language) 297, 307, 330
Castles: France **799;** ***Minoans and Mycenaeans: Greece's Brillant Bronze Age.*** By Joseph Judge. Feb., 142-185; Spain **299,** 301, 305, 306, 307, **326**
Catalan (language) 315; Area spoken 303, 315; Dialects 315, 316
Catalan Republic 316
Catalans: Character 308
Catalonia (region), Spain 303, 315-316
Catamaran **220-221**
Catfish **67,** 402, **410,** 413
Cathedrals: France 806; Moscow **5, 22, 28, 29,** 33; Soviet Armenia **867,** 873
Catherine the Great, Empress (Russia): Carriage **31**
Catholic Monarchs: Spain 307, 330
Cattle: Australian stations 606, 607, 608, drought victims **607;**

France: Charolais 796, 805, traders 799, **804-805;** Mexico **626-627;** Netherlands **716;** Yukon **567,** 571, 574
Caves: Arkansas **422,** 426; Australia **588;** Wadi Qumran, West Bank 228, 238-239, **240-241**
Caviar industry: Hudson River 70, 74
Cawthron, Debbie **706**
Cells: Electron micrographs 364, 373, 379, 380, first 379; Fibrillar matrices 380
Cells: France 803, 809, 810, 816
Central America *see* Panama
Central High School, Little Rock, Ark. 410
Cercedilla, Spain: Mayor, former **325**
Cervantes, Miguel de 320, 331; Monument to **319**
Chadwick, John 181
Chagres River, C. Z. 293; Dam 292
Chaney, Richard **284**
The Change in Spain. By Peter T. White. Mar., 297-331
Chao Kao 452, 459
Chapeau Rouge (restaurant), Dijon, France 803
Chaplin, Charlie: Miniature sculpture of **863**
Chapman, "Chappie" 570-571
Charge-coupled devices (CCD's) 364, **382,** 386, 389; Enlargement **383**
Chariots, war: Chinese tomb 440, **446-447,** 448, 449-450
Charlie, Alfred, and sons **556, 557,** 560-561, 564-565
Charms: Evil spirits, safeguard against **348,** 358
Cheek family: Philanthropy 709
Cheekwood estate, Nashville, Tenn. 704, 709
Cheeses: Crete **166;** Spain 300, 322
Ch'en Hsueh-hua 448, 450, 451
Chephren, pyramid of: Cosmic-ray study 376; Diagram **376**
Chevignard, Jacques 812, 814
Chiapas State, Mexico 620, 627; Maya **651, 654-655;** Oil fields 620, 625
Chicago! By Harvey Arden. Apr., 463-493
Architecture 469, **474, 475,** 479, **480,** 481, **481,** 483; Skyscrapers **461-462,** 466, **468,** 469, 483, tallest three 460, 464, **468,** 469, **476, 477**
Ethnic diversity 470, 478, 479, 480, 484, 485, 492
Financial district **464,** 469-471
Fiscal situation 465, 490
History 474, 479; Fire (1871) 464, 469, 473, 479, rebuilding 480-481
Homes 479, **480-481, 483,** 484
Industry 473-474, **490-491;** Loss of 487, 490
Lakefront 464, **473, 476-477,** 481, 483-484
Map 468
Mayors 483, 485, 489; Former *see* Daley, Richard J.; Present *see* Bilandic, Michael A.
Neighborhoods 471, **478-479,** 484, 485, 486, 489
Parks and beaches 464, **476-477,** 481, 492
Politics 465, 466, 473, 483, 485-487, 489, 492
Population 466, 474, 479; Blacks 484; Metropolitan area 487
Reputation 466, 471, 473
Sculptures 469, **474, 475**
Sports **484, 485,** 492
Stockyards: Site 469, **470-471**
Transportation 469, **482, 493;** Hub 473, 474, 492
Writers **463,** 469, 471, 473, 481, 484; Journalists 466, 469, **484,** 490, 492
Chicago Board of Trade 470-471; Building 469; Options Exchange 470
Chicago Cubs (baseball team) 492; Player, former **485**
"Chicago Plan" 483
Chicago River, Ill. 474, 479; Lock, outer **477**
Chicago Sanitary and Ship Canal, Ill. 479
Chicago School (architecture) 483
Chicken farming: Arkansas 398, 403, 417, 423; France: *poulets de Bresse* 799, 802; Old Order Amish 754
Chihuahua State, Mexico: *charreada* **646-647;** Land invasions 612, **616-617**
Child Development and Mental Retardation Center, Seattle, Wash. **388**
Chilkat River, Alaska: Bald-eagle gathering **196-197,** 199
Chilkoot Pass, Alaska–Canada 549, 552; Climbing 549, 552, gold-rush trek (1898) 549, 552, 553, 576
Chilton, Kenneth **128,** 129
Ch'in Shih Huang Ti, Emperor: ***China's Incredible Find.*** By Audrey Topping. Apr., 440-459
Assassination attempts **453,** 454
Capital 451-452, **454-455,** 459
Death 440, 459
Empire: Map 450
Government 453
Palaces 452, **455;** Number of 452
Paranoia 452, 454
Reforms 440, 452-453, 454
"spirit city" 451; Diagram **450**
Tomb 440, 448; Construction 442, **445-447,** 448, 451; Desecration 440, **443-444,** 448; Diagram **450-451;** Discovery 440; Excavation 440, **441,** 448, **449,** 450, **458,** cover ill., diagram of area **450-451;** Inner sanctum **442-444,** 448; Relics 440, **441,** 442, 448, 449, **449,** 450, **458, 459,** cover ill.
Unification of China 440, 452, 454, 459
Ch'in, State of, China: King 440, 442, 448
China, Peoples Republic of: Border closings 346, 347, trade caravans, effect on 342, 346; ***China's Incredible Find.*** By Audrey Topping. Apr., 440-459; Ladakh, seizure of (1962) 335, 349
Chinchilla, Spain 301
Chinese dynasties *see* Chi'n Shih Huang Ti
Chinese-Indian War (1962): Ladakh 335, 338, 349
Chinese porcelain: Islamic imitation **791,** 792
Ching K'o **453**
Chippewa National Forest, Minn. *see* Bald eagle
Cholula, Mexico: Church **615**
Chortens: Ladakh 338, **351,** 353
Chrism: Replenishing of **866**
Christianity: Ecumenical community: France 810, 812; ***The Proud Armenians.*** By Robert Paul Jordan. June, 846-873; *see also* Holy Week
Chung-Kuo (the "pivotal kingdom") 448
Church, Frederic Edwin 64, 83
Churches: France 795, 806, 810, 812, **813;** Mexico **615,** 618, 638; Moscow 9, **38-39;** *see also* Armenian Apostolic Church
Cistercian monks 806, 808
The City Around Red Square: Moscow. By John J. Putman. Jan., 2-45
Ciudad Sahagún (manufacturing complex), Mexico 625
Civil War, U. S.: Gulf Coast 208, 220; Pennsylvania 735, 754; Tennessee 699, 703
Clamecy, France: Medieval house **807**
Clark, Cecil and Sybil 202, **212**
Clarke, J. R., & Son 81
Clavé, Jesús **616**
Clay art *see* Pottery; Terra-cotta sculpture
Clearwater (sloop) 67, **68-69**
Clermont (estate), N. Y. 83
Clinton River, and valley, New Zealand **118-119,** 121, 122
Cluny, France: Abbey 806, 810
Clusius, Carolus 714
Coal: Continental shelf, Canadian 507; *see also* Pennsylvania
Coal Hill, Pittsburgh, Pa. 737
Cobb, Jodi, photographer: ***There's More to Nashville than Music.*** May, 692-711
Cockroach: Ancestor of termites 538-539
Coffee: Brazil 256, 257, 265, 267, **270,** freeze 257, 262-263, 267, 271, states 246
Coffin, copper: Chinese tomb **443,** 448
Coins: Byzantine 770, 788, 790, 792; Jewelry **652**
Cold Spring, N. Y.: Beach 73
Coleman, Joe 736
Collective farming: Armenian S.S.R. 867; Mexico 631, 633
Collins, Michael: ***Of Air and Space***

(National Air and Space Museum). June, 819-823
Colombia: Caiman-skin exports 97
Colón Romano, Manuel 625
Colón, Panama 279, 280, 288, 289
Columbus, Christopher 279
Commodity exchanges: Chicago, Ill. **464,** 469-471
Communist Party: Spain 305, 322, 325, 330, secretary-general 322; U.S.S.R. 44, general secretary **17,** 40
Como, Perry 699, 710
Computed-tomography (CT) scanner **372,** 377; Images **372,** 377
Computer applications: Astronomy **361-362,** 364; Contour mapping 376, human body **363, 365,** 376-377; Landsat 367, 370, **370;** Lunar mapping **384-385;** Medicine and health **360, 364-365, 372, 374-375,** 377, 383; Pyramid, cosmic-ray study of **376;** Soviet assembly line **17;** Tulip auction **722,** 723
Con Hook Rock, Hudson River: Oil spill cleanup 84-85
Conestoga wagons: Origin 760
Confectionery: Day of the Dead 665, 667, **667**
Confederate Air Force museum: Harlingen, Texas 222
Confederate immigrants: Brazil 256, 267
Confeitaria Colombo (restaurant), Rio de Janeiro **252-253**
Confrançon, France 802
Confucian scholars: Persecution of 451, 452, 453, **457**
Connors, Mike **857,** 858
Conquistadors: Mexico 614-615; Spain 327, 330
Conservation: Bald eagle 198, 199; Ocean 498, 507, 514, 521; *see also* Crocodilians; Hudson River
Consolidated Edison power plants: Nuclear 86; Pumped storage, proposed 69-70
Continental Congress: Pennsylvania 734, 754
Continental Divide 141, 287, 294
Continental drift 502, 511, 524
Continental shelf, Atlantic Coast, U. S.: ***The Continental Shelf: Man's New Frontier.*** By Luis Marden. Apr., 495-531
Divers and diving: Research 527, 530-531
Dumping 497, 510, **520, 521,** 524
"economic zone" 509, 514, 515, 518
Fish 496, **501,** 506, 509, 511, 514, 515, 518, **528-529**
Fishing industry 497, 501, **508-509,** 509, **512,** 513, **513,** 514-515, 518, 527
Formation 496, 511; Cutaway diagram **511**
Maps 496-498, 510-511
Oil 496, 498, 501, 507, 510, 514; Leases 498, 507, 510
Pollution 497, 510, **520,** 521, **521;** Oil spill **516-517**
Research 527, 530-531, **530-531**
Contraband: Crocodilian items 97, **114**
Conway, Ark. 415
Cook, Jim and Donna **483**
Cook, Junior 413
Copacabana Beach, Rio de Janeiro **249,** 272, 274
Coral **522, 523;** Core samples **519**
Corcovado, Rio de Janeiro 272
Cordell, Carl Richey, Jr. 408-409
Cordry, Donald and Dorothy 661
Coria, Alberto 618
Corning Glass Works Foundation: Serçe Limanı expedition 774
Cornwall (county), England: Tin mines 803
Cornwall-on-Hudson, N. Y. 69
Cortés, Hernán 327, 330, 614-615, 621
Cortes (parliament) 306, 330
Cortes of Cádiz (1812) 306
Cosmic rays: Pyramid study **376**
Costa, Lucio 269, 272, **277**
Costa Blanca, Spain 301, **304, 305**
Costa de la Muerte, Spain 323, 326
Costa del Azahar, Spain 316
Costa del Sol, Spain 306
Costa Verde, Brazil **258-259**
Costa Verde, Spain 323
Costakis, George **11**
Costonis, John 483
Côte d'Or (department), France 795, 812, 814
Counter-Reformation: Spain 300
Country music *see* Nashville, Tenn.
Cousteau, Jacques-Yves 523, 524
Craig, Shelly **558**
Crete, ancient *see* Minoan civilization
Crete (island), Greece: Potters **152;** Workers **166-167, 172, 173, 183**
Crewe, Albert V. 380
Crocodilians: ***A Bad Time to Be a Crocodile.*** By Rick Gore. Jan., 90-115
Anatomy: Brain 91; Digestive system 108; Heart 91; Jaws and snout 94, 95, **94-95,** 98, **98-99,** 100; Pouch, maternal **90-91;** Teeth 94, 95, 98, **98-99**
Behavior: Displays 92, **100,** 102, **103,** 108; Feeding 98, 100, 108, 114; Nesting 97, 101, 103, 108
Benefits from 97, 100
Cannibalism 101, 108, 114
Classification: Families 94-95; Order 91, 94; Species 91, 94, **94-95;** Subspecies 94
Courtship; mating **103,** 108
Cults: Ancient Egypt 97, 101-102; Australian Aborigines 96, totem **97**
Eggs 92, 96, **99,** 100, **102,** 107; Incubation 103, 108; Laying 101, 102, **103,** 108
Endangered status 91, 94, 95; Coded painting **94-95;** Laws protecting 91, 96, 97, 111, 114, local exemptions 111, 112; Reestablishment programs 99, 100, 101, 102, 108, 111, 114; Safe species 91, 94, 95, 111
Extinct in the wild 95, 97
Habitats 91, 92, 96, 98, **106, 107,** 108, 111, 112, 114; Loss of 90, 91, 100, 111, 114
Hatchlings; young **90,** 92, **99,** 100-101, **102, 107,** 108, 111, 112, 114; Nursery 91, 108, 111; Predation of 107, **107,** 111; Transport of **90,** 108, 111
Hazards 90, 91, 95, 96, 97, 100, **107,** 110, 111, 114
Intelligence 91, 92
Life span 92
Man-killers 96-97; Attacks 92, 96, 110, **110,** 111, 112
Map: World distribution 94-95
Range 94-95, 98, 111, 114; Composite painting **94-95**
Refuges 92, 101, 102, 103, 108, 114
Size 92
Social order 92, 102; Dominance role 102
Study of 90, 91, 92, 96, **96,** 97, 98, 102, 103, 108
Territoriality **100-101,** 102, 108
Weight 92
see also Skin trade, *outlined*
Crosby, Karl 578
Crosby, U.S.S. 290
Cross Fork, Pa. **749**
Crossbows: Chinese tomb 442, 448, 450
Croton Point, N. Y.: Beach 73
Crowley, Wayne **512**
Crown jewels: ***Imperial Russia's Glittering Legacy.*** Jan., 24-33
Cruise, Agusta **744**
Crusade, Second 795, 806, 812
Crustaceans 524; Crabs **523,** blue **66,** 73, 77; Crayfish, boiled **210;** Krill 524; Lobsters, American **501;** Shrimp **201,** 204, **501**
Cuautla, Mexico: Veterans of the Revolution **618-619**
Cuenca, Spain: Holy Week 300
Culebra Cut, Panama Canal **286-287,** 293
Culiacán, Mexico 627-628
Culinary Institute of America: Hyde Park, N. Y. 86
Cullet 770, 775, 787, **793**
Cults: Bull cult, Minoan 150-151, 164, **164-165;** Crocodile cults: Ancient Egypt 97, 101-102, Australian Aborigines 96, **97**
Cumberland River, Ky.–Tenn. 692, **694-695,** 699
Cunyu, Australia 607, 608
Cups: Glass **770;** Gold **28, 168, 184**
Curitiba, Brazil: Aerial view **264-265;** The arts **262-263;** Climate 263; Housing 263; Industry 265, 266; Mayor, former **265,** 266; Population 263, 265; University City 263
Curtiss, Glenn H. 825
Cuzzi, Jaime **364,** 376-377
Cyprus Anvil Mine, near Faro,

Yukon 560-561, 569; Ore haulers **562-563,** 570

D

DDT ban (1972): Wild-bird hatching, effect on 199
Dagger, Mycenaean **182-183**
Daguerre, Louis 360
Daguerreotype: Moon 364
Daley, Richard J. 465, 473, 486, 487, 490; Portrait **467**
Dams: Arkansas River 402, 409; Canal Zone 283; Hudson River 64
Dancers: Armenian **854;** Ballet 16, 38, 44, **45,** cover ill.; Crete **147,** Minoan sculpture **146;** Disco **488;** Lamaistic ritual **354-355,** 358; *pascola* mask **660;** Samba **246, 254-255,** 269, 272, 276; Square dancers **412;** Zulu-Swazi **46-47, 51, 56-58**
Darlington, Jo 538
Davenport, William: ***Living the Good Life in Burgundy.*** June, 794-817
Davidson, Robyn: ***Alone Across the Outback.*** May, 581-611
Davidson County, Tenn. 695, 706
Davis, Marc 470-471
Davtyan, Gagik S. 867
Dawson, Yukon 571, **573-575,** 576,578; Discovery Days games **552-553;** Follies 578; Parade **574-575;** Population 574, 576, gold rush era 574, 576
Day of the Dead: Mexico 665, bread **666,** confectionery 665, 667, **667**
Dayian, Sossi **854**
De-Dee-Mae (trawler) **512**
Dead Sea, and region, Israel–Jordan: ***The Living Dead Sea.*** By Harvey Arden. Feb., 225-245
Altitude 225, 231; Diagram **231**
Basins 230, 231; Map 231
Curative waters and mud 233, 238
Density 228, 230
Dimensions 230, 231
Energy source, potential 230, 233
Fish, washed-in 230
Great Rift, part of 231, 233
History 225, 228, 233, 235, 236, 238-239, 240-241, 243, 245
Israeli territory 228, **229, 232-237,** 233, 238 *see also* West Bank, *below*
Jordanian territory **224, 226-227,** 239, 241, **242-245,** 243, 245 *see also* West Bank, *below*
Land reclamation 233, 238, **244-245**
Life forms 230, 233
Map 231
Minerals 228, **228-229**
Names 228, 233, 245; "Dead Sea" misnomer 230, 231
Roads 225, 228, 241
Temperatures: Atmosphere 228, 230; Surface of water 230
Water level 230; Diagram **231;** Map 231; Plan for raising 230
West Bank (Israeli-occupied Jordan) 225, **226-227,** 228, **236,** 238, 239, **240-241,** 241, 245
Dead Sea Scrolls 228, 239, **240**
Dead Sea Works, Sedom, Israel 228, **228-229**
Death masks: Mycenaean **142-143,** 151, cover ill.
Delaware (river), U. S. 731, 735, 736, 743
Delta (region), Ark. 396, 399, 402, 403, 412, 413, 420
Dentist, sidewalk: Ladakh 358
Desalination: Bacterium applicable to 233; Soil 233, 245
Deserts: Mexico **638-639;** *see also* Camel trip
de Soto, Hernando 327
Destin Inlet, Fla.: Interface experiment **502-503**
Developmental psychology: Photography, uses of 383-384, **388**
Devils, pottery **648-649,** 649, 650
De Vise, Pierre 490
DeVore, Nicholas, III, photographer: ***Brazil's Golden Beachhead.*** Feb., 246-277
Diadem, gold: Celtic 803
Diamonds **25, 26, 30,** 420
Dickranian, Archie 853, 858
Dierkers, Alwin 257
Dijon, France 803, 806
Diskit Wangmo, Queen (Ladakh) **337,** 352
Divers and diving **845;** Suit, atmospheric **494;** *see also* Archeology, underwater; Continental shelf
Dlamini, K. H. **48**
Dofan (French leather firm): Crocodile slaughter 111
Dogs **580, 598,** 605, 608; Alligator attacks on 91, **110,** 112; Doberman pinscher **562;** Sled dogs **556, 557,** 560, 561; Wild: Poison for 582, 605, 607, 608
Dogsleds **556;** Replacing, other vehicles 556, 570
Domaine d'Auvenay, France: Banquet **811**
Domecq, Alvaro **321,** 327
Domecq, José Ignacio **314**
Domínguez Reynoso, Salvador 625
Donelson, John 699
Donkeys: Jordan **242;** Ladakh **332-333,** 333, 342; Spain **308**
Donskoy Monastery (architectural museum), Moscow **6**
Doongsay Rimpoche, Drukpa 358
Doorninck, Frederick van 774-775, **777,** 786, 787, 790
Doryzas, N. 281
Douglas DC-3 (aircraft) **820-821,** 822-823
Dovel, William 63, 64, 74
Dowling, Dick 220
Doyle, Robert E. 1
Dragon, wooden **442-444**
Dragons of the Deep. By Paul A. Zahl. June, 838-845
Drake, Edward Laurentine 740, 742
Dredging: Gulf Intracoastal Waterway 217, cessation 222; Panama Canal 294
Driftmaster (trash collecting boat): New York Harbor **72**
Drought: Australian desert 582, 606, **607**
Duck hunters: Arkansas 402, **411**
Duero (river), Spain 305, 327
Dung, yak: Fuel 340, 342, 353
Dunlap, Louise 514
Dunstan, Thomas C. **190;** ***Our Bald Eagle: Freedom's Symbol Survives.*** Feb., 186-199
Dwellers in the Dark (termites). By Glenn D. Prestwich. Apr., 532-547

E

Eagles *see* Bald eagle
Earth: Water cover 514
Earth Resources Observation Systems (EROS) Data Center, Sioux Falls, S. Dak. 367, **370**
Earthquakes: Crete 144, 172, 175, 179
East Africa *see* Termites
Easter egg, jeweled (Fabergé) **25**
Easygoing, Hardworking Arkansas. By Boyd Gibbons. Mar., 396-427
Ebro (river), Spain: Delta 316
Echeverría, Luis 623, 625
Echmiadzin, Soviet Armenia: Armenian Apostolic Church 861, cathedral **867,** 873, Supreme Patriarch **866,** 872, 873
Ecumenical community: France 810, 812
Eddie, Mr. (Aborigine) 583, 595, 597, 600, **601,** 602
Edgar E. Clark (Liberty ship): Sinking of **506**
Edwards, Mike 579; ***Mexico: "A Very Beautiful Challenge."*** May, 612-647
Effigies, bark-paper **657**
Egdemir, Yüksel 770, 777, 786, **788**
Eggs: Albatross **672-673;** Candling **417;** Jade **25;** *see also* Crocodilians
Egrets, great snowy **218-219**
Egypt, ancient: Crocodiles revered 97, 101, 102
Einarsson, Thordur 523
Eisner, Thomas 384, 389
Elcano, Juan Sebastián 309
Electromagnetic spectrum 364; Uses **368-369**
Electron microscopes 364, 368, 372, 379, 380; Micrographs **368, 373;** Stereographs 380
Electrons 367, 381
Elevated railway: Chicago, Ill. 469, **482**
Eliot, John L.: ***Hawaii's Far-flung Wildlife Paradise.*** May, 670-691

Elliott, Mount, New Zealand **120,** 123
Ellisman, Mark 364, 380
El Paso, Texas 623
Emery, Kenneth O. 502-503, 507
Emphysema: Gamma-ray image **375**
Empire State Plaza, Albany, N. Y. **75**
Enclaves, Spanish: Africa 303, 306
Endangered species: Monk seal 683; *see also* Bald eagle; Crocodilians
Energy: Dead Sea potential 230, 233; Hydroelectric plants 69-70, 250, 257; Nuclear power plants **86,** 251, 257, **260,** 743, 746, 766; Solar power 96, 230, 233
En Gedi (kibbutz), Israel **232-233,** 233, 238
Entertainment industry *see* Nashville, Tenn.
Environmental concerns: Gulf Intracoastal Waterway 201, 209, 217, 219, 222; Herbicide opponents 417; Offshore oil drilling 498, 507, 514, 521; Pennsylvania 737; Yukon pipeline controversy 559; *see also* Hudson River
Environmental Defense Fund 81
Environmental Protection Agency (EPA) 70, 77, 81, 82, 86, 507
Erie, Pa.: Shipping 753
Erie, Lake, Battle of (1813) 754
Erie Triangle, Pa.: History 734
escargots de Bourgogne 803, **810**
Espinosa Martínez, Julio 638
Essenes 238-239, 240-241
Ethel H (barge): Wreck **84**
Ethiopia: Crocodiles 111
Ethylene gas: Tulips 727
Eureka Springs, Ark. 423
Europa (mythology) 164, 166
Europe: Caiman-skin imports 97; ***Minoans and Mycenaeans: Greece's Brilliant Bronze Age.*** By Joseph Judge. Feb., 142-185; *see also* Burgundy, France; Moscow, U.S.S.R.; Netherlands; Serçe Limanı, Turkey; Spain
European Highway (freighter) 290
Euskara (language) 303, 307, 308
Evans, Sir Arthur John 148, 151, 152, 160, 181; Bust of 152; Painting of **148**
Evans, Dale **707**
Evans, John 169
Everett, George 569
Everglades, Fla.: Alligators 97, 114; Landsat image **370-371**
Exorcism: Brazilian spiritists 274; Christian ritual (A.D. 301) **849;** Lamas practice **351,** 353
Explorer II (balloon) 823
Extinct species: Birds 672; Crocodilians 95, 97
Extremadura (region), Spain 327, 330
Eyes of Science. By Rick Gore. Mar., 360-389
Ezangs, Sonam Paljor 335, 338, **341,** 342; Family 335, **340-341**

F

Fabergé, Carl: Egg, jeweled **25**
Face painting **665**
Fairmount Park, Philadelphia, Pa. 736
Falcon Jet plant, Little Rock, Ark. **405**
Falla, Manuel de 323
Farm-machinery auction: Arkansas 396, 398, **398-399**
Farmers and farming: Crete **172, 173;** New York **80, 81,** 86; Spain 307, **308-309,** 321; Tennessee **702-703;** Yukon Territory **566-567,** 571, 574; *see also* Arkansas; Burgundy, France; Ladakh; Mexico; Pennsylvania
Farmland, wasteland converted into 233, 238, **244-245, 746-747, 868-869**
Faro, Yukon 569; Mine near **560-561,** 562, 569-570
Farragut, David 208
Faubus, Orval 410, 413, 415
Feathers: Headdresses **46, 56,** 57, **57,** ostrich **58, 59;** Millinery trade (early 1900's) 671
Feder, Jody and Robin **81**
Federal Coal Mine Health and Safety Act 740
Federal Refuse Act (1899) 67
Felipe, Prince of Asturias **328, 329**
Ferdinand II of Aragon, King 307
Fermi National Accelerator Laboratory, Batavia, Ill. 367, 380-381
Fernández, Gregorio 300
Fernández-Morán, Humberto 364, 367
Ferraz, Alceu Serpa 262-263
Fertility rites: Mexican Indians 661, 663
Festivals: Arkansas **412;** Armenian **854;** Carnival *see* Rio de Janeiro; Gulf Coast, U. S. 204, **216;** Hudson River **68-69;** Philadelphia, Pa. **738, 739;** Spain **296,** 297, 300, 301, 305; U.S.S.R. **22-23,** 40; Yukon Territory 552
Fiber optics: Medical technique 379
Fields, W. C.: Quoted 736
Fig tree, wild: Bark paper 661
Figurines: Mexico: Chicle **658,** clay **648-649,** 649, 650, **658**
Fiordland National Park, New Zealand *see* Milford Track
Firemen: Chicago, Ill. 479-480
Fires: Chicago, Ill. 480, Great Fire (1871) 464, 469, 473, 479, rebuilding 480-481
First City Troop: Philadelphia, Pa. 736
The First Emperor's Army: China's Incredible Find. By Audrey Topping. Apr., 440-459
First National Bank, Little Rock, Ark.: Lobby performance **405**
Fish, silver: Necklace **653**
Fish farming: Arkansas 402, **410;** Ocean 524, **528-529,** experiments **500-501**
Fish preserve: France 808
The Fish With Bifocals. By Paul A. Zahl. Mar., 390-395
Fishermen: Arkansas 407-409, 413, **427;** Crocodilians, threat to 100, **107,** 111; Fresco of **161,** 180; Gulf Coast, U. S. **201,** 203; Hudson River **62,** 63, **63, 71,** 73-74, 77, 19th century **70;** Jordan **230**
Fishes: ***The Hudson: "That River's Alive."*** By Alice J. Hall. Jan., 62-89; Porcupine fish **684;** Tangs, convict **685;** Trout, brown 121, 127; *see also* Four-eyed fish; Sea dragons
Fishing, commercial: Arkansas 413; *see also* Continental shelf; Hudson River
Fishing, sport: Arkansas 407-409, **427;** Chicago, Ill. 474; France **808-809**
Fishing-lure manufacturer 408-409
Fisk University, Nashville, Tenn. 703; Graduation **708-709**
Five Finger Rapids, Yukon River 571
Flaherty, Thomas 82
***The Flight of the* Gossamer Condor.** By Michael E. Long. Jan., 130-140
Flightless birds: Australia **605;** New Zealand 117, **120,** 121
Floods: Johnstown, Pa. 766; Morgan City, La. 219
Florida: Alligators 97, **110,** 112, **113,** 114, **115;** Crocodiles 95, 114; Gulf Coast 200, 201, **202,** 203-204, 208, 219, **220-221;** Landsat image **370-371**
Florida Game and Fresh Water Fish Commission: Alligators 110, **110,** 112; Officers **110**
Flowers **608;** Mountain buttercups **120;** Mustard plant **339;** Oleander **216;** "red-hot poker" **120;** Turnip plants **308-309;** Ultraviolet photography 368, **380,** 389; Vendor **857;** Wild crocus **565;** *see also* Tulips
Fokker D.VII (biplane) **826**
Folk art: ***Mexican Folk Art.*** By Fernando Horcasitas. May, 648-669
Follies, old-time: Yukon Territory **548-549,** 578
Fontenay, Abbey of, France 806, 808-809
Food chain: Continental shelves 511, 514, 517, 524; Hudson River estuary 66, 76, 88, diagram **67**
Food-processing industry: Arkansas 403, 415, **416**
Foott, Jeff **192;** photographer: ***Our Bald Eagle: Freedom's Symbol Survives.*** Feb., 186-199
Ford, Gerald R. 823
Ford plant: Valencia, Spain 317
Ford Tri-Motor (aircraft) **820-821**
Forest-products industry: Arkansas 403, 415, **417**
Forrest City, Ark 415
Fort Chaffee, Ark. 412
Fort Donelson, Tenn. 699
Fort Edward, N. Y. 77

Fort Nashborough, Tenn. 699
Fort Necessity, Pa. 734, 754
Fort Selkirk, Yukon 571
Fort Sherman, C. Z. 293
Fort Smith, Ark. 402, 403, 420
Fortresses *see* Castles
Fossils: Australia **608;** Continental shelf 503
The Four-eyed Fish Sees All. By Paul A. Zahl. Mar., 390-395
Eyes **392, 393;** Diagram **392**
Food 392, 394, 395
Hazards 392, 394, 395
Optic-nerve bundles **390-391, 394-395**
Range 390
Schools of **390-391, 394-395**
Vision, dual 390, 392
Fox, Patrick, and family 121
Foz do Iguaçu, Brazil 250
France: Celts 803, 809, 810, 816; Crocodilian-skin market 91, 111; *see also* Burgundy, *outlined*
Franco, Francisco 297, 303, 306, 307, 312, 316, 322, 324, 325, 330
Franklin, La.: Streetlamps **208**
Franklin, Tenn. 699, 703, 706
Frazer, Sir James 164
Freedom 7 (spacecraft): Interior **835**
Freedom Week: Philadelphia, Pa. **738, 739**
The French: Panama Canal effort 279, 280, 281, 287, 290, 293
French and Indian War 734, 754
French Frigate Shoals, Hawaiian Islands **675,** 684, 691
French Guiana: Caiman skins 97
French Quarter, New Orleans, La.: Musician **215**
French settlers: Louisiana 209
Frescoes: Assumption Cathedral, Moscow **28, 29;** Minoan **157-159,** 160, **161,** 163, **168-169, 171,** 180
Fresno, Calif.: Armenians **856,** 858, 861-862
Freson, Robert, photographer: ***Living the Good Life in Burgundy.*** June, 794-817
Friedkin, Bill 469
Friedman, Milt 469
Frog: Crocodile prey **105**
Fromont, Gabriel, and wife 802
Fruit growing: Hudson River valley **80,** 81, 86; Spain 300, 303, 309, 321
Fu-su, Prince (China) 453, 459
Fuerze Nueva party: Spain 322, rally **324-325**
Fujita, T. Theodore 376
Fulton, Richard 692, **694**
Fulton, Robert 83
Fulton Fish Market, New York, N. Y. 74
Fungus gardens: Termite mound 539, 541, 542, **547**
Furniture manufacturing: Arkansas 415, 420
Fusion, nuclear: Photographing of 360

G

Gabheni, Prince (Swaziland) **48, 59**
Gahan, Gordon, photographer: ***The City Around Red Square: Moscow.*** Jan., 2-45; ***Minoans and Mycenaeans: Greece's Brilliant Bronze Age.*** Feb., 142-185
Gaillard, David Du Bose 287, 293
Gaillard Cut, Panama Canal 281, **286-287,** 292, 293
Gale, Barbara 571
Gale, Nathan 292-293, 294
Galicia, Spain 326; Language 303, 307, 326; Wild ponies **312-313**
Gallego (language) 303
Gallegos: Character 308, 326
Galveston, Texas 204, **216**
Galveston Bay, Texas **200-201**
Gamboa, C. Z. 289
Games: Dominoes 7, **266;** "Game of Beasts" 269; Greased-pole climbing **552-553**
Gamma rays: Discoverer **368;** Uses 364, **368-369, 375,** 385, lunar mapping **384-385**
Gans, Stephen 379
Garber, Paul 823
García, Alfonso **656, 657**
García Bozón, David 631, 633
García Roel, Fernando 644
Garza Lagüera, Alejandro 641, 644
Gas-a-Gas (racehorse) **414**
Gastronomic societies: San Sebastián, Spain 309, 312, **315**
Gates, George 121, **128**
Gatun Lake, C. Z. 279, **280-281,** 281, 282, 283, 287, 290, 292, 294
Gatun Locks, Panama Canal **278,** 282, 287, 289
Geisel, Ernesto 248
Gems: ***Imperial Russia's Glittering Legacy.*** Jan., 24-33
General Electric capacitor plants: Hudson River contaminants 77; PCB use 77, 81
George, Saint: Statuary **31**
George Peabody College, Nashville, Tenn. 708
Georges Bank, Atlantic Ocean: Fish 514, 517; Oil exploration 510; Oil spill 517
Geothermal waters: Dead Sea region 233, 238, 241, 243, **244-245**
German immigrants: Arkansas 399, 419; Brazil 257
Germanic tribes: France 803
Germany: Spanish civil war 303, 312; World War II: Submarines in Gulf of Mexico 204
Germany, Federal Republic of: Fishing industry **508-509,** 523; Gift to U. S. 823
Gettysburg, Pa.: Battle of (1863) 735, 754
Gharial (gavial): ***A Bad Time to Be a Crocodile.*** By Rick Gore. Jan., 90-115
Gibbons, Boyd: ***Easygoing, Hard-working Arkansas.*** Mar., 396-427
Gibraltar, Rock of 306
Gibson Desert, Australia 582, 589, 590, **594,** 595, 602, 606
Gilka, Jan **124**
Gilka, Robert E., photographer: ***New Zealand's Milford Track: "Walk of a Lifetime."*** Jan., 117-129
Girl Guide, Armenian **854**
Girwa River, India: Gharials 98
Gislebertus (sculptor) 806
Glacial melt: Ladakhi water supply 332, 333, 338, 342, 346
Glacier National Park, Mont.: Bald-eagle gathering **198,** 199
Glaciers: New Zealand **120,** 123, 129
Glass, Islamic: ***Glass Treasures From the Aegean.*** By George F. Bass. June, 768-793
"glass wreck" 729; ***Glass Treasure From the Aegean.*** By George F. Bass. June, 768-793
Age 769, 788, 790, 792
Cargo 770, 788, 790, 792; Origins 785, 786, 787
Construction 780, 787, 790
Crew 787, 792
Diagram **780**
Location map 772
Origin 770, 790, 792
Preservation 790, 792
Glassworks, medieval Islamic **774-775,** 785, 787
Glen Helen Tourist Camp, Australia 583, 589
Glens Falls, N. Y. 73, 82
Gliders *see* Sailplanes
Glittering Cities, Lonely Wild Lands. Jan. supplement
Goethals, George Washington 141, 289
Gold: Artifacts: Celtic 803, Minoan 166, **168, 178-179,** Mycenaean **142-143,** 148, 151, 181, **184,** cover ill.; ***Imperial Russia's Glittering Legacy.*** Jan., 24-33; Price of (1978) 572, 578; Yukon Territory 549, **572,** 576, 578
Gold Coast, Chicago, Ill. 483-484
Gold Hill, C. Z. 283
Gold mining: Yukon **572,** 576, 578
Gold rush *see* Yukon Territory
Golden club (aquatic plant) 88
Golden Triangle, Pittsburgh, Pa. 737, **756-757**
Goldfish: Hudson River, N. Y. **67**
Goldsmith: Mexico **652**
Goldstein, Carl 746
Golf: Rooftop putting green **404**
Gölönü, Gündüz 777, 786, 787
Gómez López, Augustín 620
González, Carlos Hank 636
González, Salustio 630-631
Gore, Rick **365;** ***A Bad Time to Be a Crocodile.*** Jan., 90-115; ***The Wondrous Eyes of Science.*** Mar., 360-389
Gorge of the Dead, Crete 147, 175
Gorky Park, Moscow **2-3,** 7
Gospel writers: In art **33**
Gossamer Condor (man-powered aircraft): ***The Flight of the*** **Gossamer Condor.** By Michael E.

Long. Jan., 130-140
Cockpit **133**
Construction of **132**; Materials used 132, 134-135
Crashes 132, **138-139**, 139
Design 132, 134, **134-135**
Flight, historic 130, 136, **136-137**; Re-creation **130-131**
Repairs 132, **136**
Speed 132
Weight 130, 132, 135
Wingspan 130, 134
Gould, Jay: Mansion **78**
Gould, Kingdon, III, and wife **78**
Gourds, lacquered 667, **669**
Gournia, Crete: Minoan settlement 175, 178
Grabbe, Lewis 426
Graham, J. W. 160
Graham, Jimmy 423
Gran Vía, Madrid **318**
Granada, Spain 307
Grand Canyon of Pennsylvania 748, 749, **762-763**; Rapids running 748-749, 762-763
Grand Kremlin Palace, Moscow **5**, 40
Grand Ole Opry (radio show) 692, 694, 701, 711
Grand Ole Opry House, Nashville, Tenn. 692, 694, 696, **700-701**
Grand Prairie, Ark. 399, **400-401**, 402, **410**, **418-419**
Grant Park, Chicago, Ill. **476-477**
Grape growing *see* Vineyards
Graves: Crocodile 97, 102; Minoan 150, 164, 166, 175; Mycenaean 141, 151, 182, 184, **185**; *see also* Tombs
Grawitz, Pierre 111
Great Sandy Desert, Australia 582, 606
Great Wall, China: Construction 440, 451, 452, 453, **456-457**; Length 452, 457
Greece, ancient: Colony of Massalia 803; *see also* Mycenaean civilization
Greek Orthodox monastery, West Bank 245
Green, Jenny 583, 584, 589
Greendale Farm, N. Y. **80**
Greenhouses: Israel **232-233**; Netherlands: Tulips **723**
Gregory the Illuminator, Saint **849**, 873
Grehan, Farrell, photographer: ***Tulips: Holland's Beautiful Business***. May, 712-728
Grigg, Gordon 96
Grigoriev, Sasha 40
Gritsenko, Nikolay 37
Grivot, Denis 806
Grosvenor, Gilbert M. 1
Grotius, Hugo: Quoted 506
Gryba, Wally 567
Guadalajara, Spain 320
Guadalquivir (river), Spain 305
Guadiana (river), Spain 305
Guanabara Bay, Brazil 248
Guanajuato, Mexico **630-631**
Guano industry (1900's) 672
Guardia Civil: Spain 315, 317
Guardia Nacional: Panama 289, 290
Guarnieri, Camargo 274
Guckert, William **747**
Guernica, Spain: Bombing of 312, commemoration 312, 315
Gukasyan, Loris 852
Gulf Intracoastal Waterway, U. S.: ***The Gulf's Workaday Waterway***. By Gordon Young. Feb., 200-223
Barges **200-201**, 204, **207**, 209, 212-213, 217, 218, 219, 222
Boats 201, **202-203**, 204, 219, **220-221**; Towboats 200, **201**, **202-203**, **207**, 213, 217-218, 222
Cargo handled: Amount 200, 203; Kinds 203, 204, 208, 217, 218; Techniques 212-213
Construction history 200, 206
Dimensions 200, 204, 206, 213
Economic advantage 209, 222
Environmental concerns 201, 209, 217, 219, 222
Expansion 200, 201, 213, 217, 219, 220, 222
Fishermen **201**; Sport: Charter boats **202**, 204
Map 206-207
Ports, major 203, 208-209, 212, 213, 214, 222
Wildlife 217, 218, 222; Birds **200-201**, **216**, **218-219**, 220, 222
Gulf Stream: Infrared image **370**
GUM (department store), Moscow **35**
Gunbarrel Highway, Australia 583, **594**, 602, 606
Gunter, Arthur 423
Gymnastics: Moscow 16, **21**

H

Haar, Herbert R., Jr. 212, 213
Hacho, Monte, Spain 306
Hakim bi-Amr Allah, al- 792
Halas, George 466
Half Moon (Hudson's ship) 64
Hall, Alice J.: ***The Hudson: "That River's Alive."*** Jan., 62-89
Hang glider **732**
Hansberry, Lorraine 484
Hanseatic League: Herring 515
Hansen-Sturm, Arnold 74
Harbor Branch Foundation: Continental-shelf research vessels 527, 530-531, **530-531**
Harker, Buster 129
Harper, Jim 191, 196, 198
Harrell, Judge 217, 218
Harrisburg, Pa.: Capitol 764, 766
Harvey, David Alan, photographer: ***Spain: It's a Changed Country***. Mar., 297-331
Hatch, Jim 413
Hathaway, Rick **85**
Hawaiian Islands National Wildlife Refuge: ***Hawaii's Far-flung Wildlife Paradise***. By John L. Eliot. May, 670-691
Hay, George 694
Hay, Keith 507
Healing ceremonies: Mexico **656**, 663
Heezen, B. C. 180
Hemingway, Ernest 481
Henderson, Richard 699
Henley, Jesse, Jr., and wife **704**
Henry VII, King (England) 515
Henson, Orvil **421**; Children **420**
Herakleion, Crete 142; Museum 147, artifacts **144**, **146**, **150**, **152**, **168-169**, **171**, **174**, **178-179**
Herbert, Glenn **108**
Hermès (leather factory), Paris: Crocodile goods 111
Hernández, Santos 639-640
Herod Antipas, King (Judea) 243
Herod the Great, King (Judea) 238, 239, 241, 243
Herodias (wife of Herod Antipas) 243
Herring 515; Blueback **66**, 83
Herron, R. E. 376, 377
Herschel, William **368**
Hides *see* Skin trade
Hiking the Milford Track. By Carolyn Bennett Patterson. Jan., 117-129
Hillegom, Netherlands: Horticultural students **716**
Himalayas (mountains), Asia: ***Ladakh: The Last Shangri-la***. By Thomas J. Abercrombie. Mar., 332-359
Himis Gompa (lamasery), Ladakh 353, **354-355**, 358, **359**
Hiser, David, photographer: ***Mexican Folk Art***. May, 648-669
Historical park, international: Trail of '98 (Canada–U. S.) 572
Hoek, J. P. van den **723**
Holland's Beautiful Business: Tulips. By Elizabeth A. Moize. May, 712-728
Holography 369; Acoustic **375**
Holt, Benny 492
Holy Week: Mexico: Judas figures 663-664, **664**; Spain: Processions **296**, 297, 300, 301, 305
Homer (Greek poet) 143, 148, 149, 151, 182, 184; Historicity substantiated 148, 151, 181, 184
Homer City, Pa.: Power plant **767**
Homesteading, urban: Philadelphia, Pa. 736, 740, squatters **740**
Honey, Richard 129
Hood, John Bell 699
Hope, Ark. 420
Hopeville, W. Va.: Sailplane-flight route 434, **436-437**
Horcasitas, Fernando: ***Mexican Folk Art***. May, 648-669
Hornerstown, Pa.: Flood damage 766
Horses: Arkansas **407**, 410, **414**, 420; Auction: Pennsylvania **764-765**; Jumping events 704, 749; Operating room, veterinary **761**; Terra-cotta: Chinese tomb 440, **445-447**, 449, **449**, 450, diagram **450-451**; Troika: Moscow **15**
Horticulture *see* Tulips
Hospitals: Beaune, France 815,

annual benefit **814-815,** 815-816; Veterinary 760, **761**
Hot Springs, Ark. 407, 408; Racetrack 420, bettor **415,** stable **414**
Hot springs: Dead Sea region 233, 238, 241, 243, **244-245;** Ouachita Mountains, Ark. 415
Hot Springs Reservation, Ark. 415
Hovsepian, Vivian **855**
Hsiang Yü 448
Hsien-yang, China: Capital, former 451-452, **454-455,** 459
Hsu Fu 454
Hu-hai, Prince (China) 459
Hudson, Henry 64
Hudson Falls, N. Y.: GE capacitor plant 77
Hudson Highlands, N. Y. 69
Hudson River, N. Y.: ***The Hudson: "That River's Alive."*** By Alice J. Hall. Jan., 62-89
Beaches 73
Boating 72, 88; Regatta **89**
Bridges **62-63, 80, 82-83**
Cleanup campaign 64, 67-69; Progress 63, 70, 72-73, 76
Dams 64
Estates 64, 66, **78-79,** 83-85
Estuary, lower 64; Map 66-67; Seasonal changes in aquatic life and salinity: Diagram **66-67**
Farms 86; Fruit farms **80, 81;** Winegrowers 86, 88
Fishermen **62-63, 71,** 73-74, 77; Association 67; 19th century **70**
Fishes 63-64, 66; Freshwater species 64, **67,** number 66; Marine species 63, **66, 67, 71,** 73, 74, number 66; PCB contamination 77, 81
Food chain 66, 76, 88; Diagram **67**
Industries 67, 70, 72, 74, 76, 77, 81
Length 64
Map 66; Lower estuary 66-67
Marshes 66, **76-77,** 88
Oil-spill cleanup **84-85**
Palisades **68,** 88
Pollution 63, 64, 66, 67; Monitoring 76, **77,** 81; Pollutants 64, 67, 70, PCB's 76-77, 81; *see also* Cleanup campaign, *above*
Power plants 64, 67, 86; Proposed 69-70; Waste-water **86**
Preservation and conservation groups 67, 68-70, 83, 84-85
Public access to shores 68, 73, 83, 84-85; Park **82-83**
Railroad rights-of-way 64, 66-67, 78, 83
Sewage plant **87**
Shipping 67, 74
Source 64
Tides 64, 66
Tributaries 64; Reservoirs 81
Water supply potential 81, 82
Watershed 64, 66; Map 66
Hudson River Fishermen's Association: Cleanup litigation 67
Hudson River Heritage 84, 85
Hudson River School painters 64
Hudson Shelf Valley, Atlantic Ocean: Currents: Diagram **521**
Human bodies: Biostereometrics **363, 365,** 376-377; Brain: CT scan, computer image **374-375,** nerve-cell membranes 364, **373;** Internal-organs studies **372,** 377, 379
Hundred Years' War 799
Hunker Creek, Yukon: Gold **572**
Hunting: Arkansas 402, **411,** 423; *see also* Skin trade
Hurel Aviette (man-powered aircraft) **135**
Hurricanes: Gulf of Mexico 202, destruction 202, 212, **213**
Huslia, Alaska: Landsat image 367
Hyatt Regency (hotel), Chicago, Ill. **472**
Hybridization: Tulips 714, 719, 724, 725
Hyde Park, Chicago, Ill. 471, 484
Hyde Park, N. Y. 85-86; Caviar merchant 70, 74; Estates **78-79,** 83
Hydrocephalus 377, 379
Hydroelectric plants: Brazil 250, 257; Hudson River: Pumped storage, proposed 69-70; Yukon-rivers potential 555, 571
Hydrographic survey boat 294
Hydroponics: Soviet Armenia 867
Hyner, Pa. **732-733**

I

Ibarruri, Dolores 330
Icarus (mythology) 134, **134**
Ice Age: Continental shelf 502-503, 519; Sea level, effect on 502-503, 511, 519
Ice skating: Moscow **2-3,** 7, **12-13**
Iceland: Fishing zone 523
Iemanjá (water goddess) 274
Iguaçu Falls, Brazil 250
Illinois *see* Chicago
Illuminated manuscripts: Armenian **849;** Buddhist **345**
Imaging techniques: ***The Wondrous Eyes of Science.*** By Rick Gore. Mar., 360-389
Imboden, Otis, photographer: ***The Thousand-mile Glide.*** Mar., 431-438
Imperial Russia's Glittering Legacy. Jan., 24-33
Inder, Terry 121
India: Crocodilians **94, 95,** 97, 98, **98-99,** 100-101, U. N. programs 98; *see also* Ladakh
Indian Ocean: Australian coast **608, 609-611,** 610
Indian Point, N. Y.: Nuclear power plant **86**
Indiana Harbor Works, East Chicago, Ill.: Inland Steel 473-474
Indians of North America *see* Mexican folk art; Yukon Territory
Indonesia: Crocodiles 96
Indus valley: Ladakh 333, **338, 339, 343**
Industrial wastes: Hudson River 64, 67, 70, 76, PCB's 76-77, 81
Infant mortality: Brazil 154
Infantry Academy, Spain **327**
Infants, study of 360, 383-384, **388**
Infrared: Discoverer **368;** Uses **86, 368-369, 370**
Ingle, Fred **382**
Ingold, Ronnie 73
Inland Steel, East Chicago, Ill. 473-474
Insects: Ants: Inch 589, weaver **541;** Beetle, bombardier **378,** 384, 389; Cockroaches 538-539; Witchetty grubs **586;** *see also* Termites, *outlined*
Institute of Nautical Archaeology 768, 774, 777
Institute of the U.S.A. and Canada: U.S.S.R. 20
Integration: Canal Zone 289-290; Little Rock, Ark. 410, 413
International Centre of Insect Physiology and Ecology: Termite study 538, 539
International Exposition (1929), Barcelona 315
International Paper Company mill: Hudson River pollution 70, 72
International Union for Conservation of Nature: Crocodile conference 92, 96, 97, 98
Intracoastal waterway *see* Gulf Intracoastal Waterway
Ipanema, Rio de Janeiro 273
Iran: Caviar 74; Tulips 724
Irish: Chicago, Ill. **467,** 470, 479, 485, 489
Iron: Farm tools, ancient 442, 450; Ironwork **481;** Moon 385
Ironclads: *Tecumseh* 208
Iroquois Steeplechase: Nashville, Tenn.: Trophies **704**
Irrigation: Crocodile habitats, affecting 111; Ladakh 338, 340, 342; Mexico 628, 631, 633, districts 620; Spain 300, 305, 309, 321, 322
Irving, Washington: Estate 64, 66, **79**
Isabella I of Castile, Queen 307
Islam: Spain 299, 305
Islamic art: ***Glass Treasure From the Aegean.*** By George F. Bass. June, 768-793
Islands of Immortals 454
Israel: ***The Living Dead Sea.*** By Harvey Arden. Feb., 225-245
Israeli-occupied Jordan *see* West Bank
Istanbul, Turkey: Armenians 851, refugees **850**
Itaipu, Brazil 250, 257
Italian-Brazilians 256, **266-267**
Ivan the Terrible, Tsar (Russia) 16, 27, 33; Throne **28**
Ivanova, Yelena L. 44
Ivanovna, Anna 9, 15

J

Jackman, Leverne 289, 290
Jackson, Andrew: Home 696, 709
Jackson, Jesse **486**
Jackson, Preston **215**
Jade: Fabergé egg **25**
Jamelle III (yacht) 208-209
James I, King (Great Britain) 503, 506
Jammu and Kashmir State, India: ***Ladakh: The Last Shangri-la.*** By Thomas J. Abercrombie. Mar., 332-359
Janel Fisheries Ltd., Nova Scotia: Tuna holding pen **528-529**
Japan: Colonization legend 454; PCB poisoning 77
Japanese: Immigrants: Brazil 256, **267**; Plume hunters (1900's) 671
Jars: Storage: Minoan 151, **153,** 160; Water: Black ware **651,** "glass wreck" **791,** pottery stands for **659**
Jazz: New Orleans, La. 214, musician **215**
Jefferson, Thomas 506
Jenney, William LeBaron 483
Jensen, James A. 729
Jerez de la Frontera, Spain 315
Jervois Glacier, New Zealand **120,** 123, 129
Jesus 225, 228, 239, 245; In art **28, 32, 33, 751, 867**
Jet Propulsion Laboratory, Pasadena, Calif.: Artificial Intelligence Laboratory (JAIL) **386,** 389
Jewelry: Gold **652;** Minoan 147, 166, 167, **178-179;** Silver **653;** Turquoise **334,** 358, cover ill., rings **415**
Jewish-Roman War (A.D. 66-73) 235, 236, 238, 239, 241
Jiménez, Fernando 638, 639
Jobim, Antonio Carlos **262,** 273
John the Baptist 228, 239, 243
John Hancock Center, Chicago, Ill. **468,** 469
Johnson, E. Frank 220, 222
Johnson, John H. **465,** 484
Johnson-Sea-Link I (research submarine) 527, 530-531; Cockpit **530**
Johnson-Sea-Link II (research submarine) 530-531, **530-531**
Johnstown, Pa.: Floods 766
Joliet, Louis 474
Jolliff, James V. 204
Jones, Charles 256
Jones, John 209
Jones and Laughlin Company: Pennsylvania: Layoffs 737, 745, steel plant **744-745**
Jordan, Howard 74, 77
Jordan, Robert Paul: ***The Proud Armenians.*** June, 846-873
Jordan: ***The Living Dead Sea.*** By Harvey Arden. Feb., 225-245
Jordan (river), Asia 228, 230, 231, 239
Joswig, Paul Martin **509**
Juan Carlos I, King (Spain) 319, 322, **328;** Quoted 328, 330
Juan de Borbón, Don (Spanish pretender) 328
Juba, Sudan: Landsat image 367
Judaean hills, West Bank 225, **226-227,** 228
Judas figures, papier-mâché: Mexico City 663-664, **664**
Judge, Joseph: ***Minoans and Mycenaeans: Greece's Brilliant Bronze Age.*** Feb., 142-185
Jungle-warfare course: Fort Sherman, C. Z. **292-293**
Jupiter C (rocket) 822
Juqueri, Lake, Brazil 261, 262

K

Kajiado District, Kenya *see* Termites
Kaloustian, Shnorhk 851
Kane, Ken 567
Kaniezian, Geber M. 867
Karakoram Pass, Ladakh–China 346-347
Karphi (peak), Crete 184
Kashmir *see* Jammu and Kashmir
Kato Zakro, Crete 175
Katzev, Michael 770
Kazan, Cap of **27**
Kazarian, Edward **863**
Keith, Don 787
Kelley, Jack 777
Kelp: Farming experiment **527;** Pacific field **526**
Kennell, John 360
Kennett Square, Pa.: Mushroom farming 760; School of veterinary medicine 760, **761**
Kentucky rifle: History 760
Kenya: Crocodiles **106,** 107, **107,** 111; *see also* Termites
Kephala (hill), Crete *see* Knossos ruins
Kepka, Zygmunt 129
Kerkorian, Kirk **856**
Kernan, Michael: ***There's More to Nashville than Music.*** May, 692-711
Keukenhof, Netherlands: Tulips and grape hyacinths **728**
Key Largo, Fla.: Crocodiles 114
Khardung La (pass), Ladakh 349
Khirbat Qumran, West Bank 228, 238-239, **240-241**
Kibbutz: Israel **232-233,** 233, 238
Kijen, Josef 248
Killifish: Hudson River marsh 88
Kilns, pottery **651, 662-663**
Kimbrough, Herbert, and family **407,** 409-410, 413
King, Martin Luther, Jr. 707
King, Wayne **114;** Quoted 91, 97
Kingston, N. Y.: Beach 73; Hudson River bridge **82-83**
Kitt Peak National Observatory, Ariz. 364, 372
Kiviat, Erik 88
Klaus, Marshall 360
Kleinclausz, Arthur 803, 806
Kline Orthopedic and Rehabilitation Center, Kennett Square, Pa. 760; Operating room **761**
Klipsch, Paul 420
Klondike District, Yukon 553, **572, 573,** 576 *see also* Dawson
Klondike River, Yukon 549, **573**
Kluane National Park, Yukon **564-565,** 567-568
Knifemakers: Arkansas 420; Crete **183**
Knobkerrie, ceremonial **49**
Knossos ruins, Crete: ***Minoans and Mycenaeans: Greece's Brilliant Bronze Age.*** By Joseph Judge. Feb., 142-185
Kobashi family **267**
Komsomol Pravda (newspaper) **19**
Kondratiev, Vladimir 44
Koring, Paul **568, 569**
Kostiuk, Wendy **562, 563,** 570
Kozlov, Alexander **14, 15**
Kraals: South Africa **46-47,** 54
Krall, Harold 389
Krasissovsky, Evgeny 518
Kremer, Henry 130
Kremlin, Moscow 2, **4-5,** 7, 16, 17, 20, **22-23,** 40; Map 7
Kremlin Armory (museum), Moscow: ***Imperial Russia's Glittering Legacy.*** Jan., 24-33
Krill: Food source 524
Krypton: Gamma-ray imaging **375**
Kunzang Namgyal, King (Ladakh) 352
Kupcinet, Irv 466, 469
Kushlan, Jim 114
KwaZulu (homeland), South Africa: ***Zulu King Weds a Swazi Princess.*** By Volkmar Wentzel. Jan., 47-61

L

Labyrinth: In Minoan myth 151, 168, 184
La Confrérie des Chevaliers du Tastevin 812
Lacquerwork 667, **668,** 669, **669**
Ladakh (district), Jammu and Kashmir: ***Ladakh: The Last Shangri-la.*** By Thomas J. Abercrombie. Mar., 332-359
Borders: Closing of 338, 346, 347; Opening of (1974) 338
Capital *see* Leh
Climate 333, 342; Temperatures 342, 349
Crafts: Cooperage 342, **352;** Spinning and weaving 340, **340;** Tools, handcrafted **352**
Division of 335, 349; Map 335
Dress **334,** 340, **340, 348,** 349, **349,** 352, cover ill.
Economy, village 340, 342; Earnings, occasional 342, 349
Equipment **340, 341;** Absence of common devices 338; Tools 342, **352**
Farming, irrigated 338, 340, 342; Crops 338, **338, 339,** 340
Food and drink 335, 338, **341,**

342, 349, 352, 353, 358
Fuel 340, 342, 353
History 335, 337, 338, 345, 346, 349, 352, 354
Indian rule 335, 338, 340, 349, 352; Army border patrol 337, 349; Parliamentary representative **337,** 352
Isolation of 335, 338, 347
Livestock 332, 335, 338, 340, 342, **346-347, 356,** 358 *see also* Transport, *below*
Map 335
Markets: Bazaar 342, 347, 349; Festival hawkers 358; Former 335, 337, 342, 346
The people 338, 340, 358; Population 335, 352
Religions 335, 352 *see also* Lamaism, *outlined*
Roads 338, 349, 353
Transport **332-333,** 333, 342, 346
Water supply 338; Glacial melt 332, 333, 338, 342, 346; Precipitation, annual 338, 342
Lakeland, Fla.: Alligators 112
Lamaism: ***Ladakh: The Last Shangri-la.*** By Thomas J. Abercrombie. Mar., 332-359
Ceremonies; rituals **351,** 353, **355,** 358
Chapels, family 342, 353
Chortens 338, **351,** 353
Deities 342, 353
Dominates Ladakhi life 338, 352-353
Festivals 353, **354-355,** 358
Founder 354, 358
Kahgyur (holy scriptures): Annual reading 353
Lamas 342, **351,** 352, 353, **354-355,** 358; Novices **345,** 353
Lamaseries 342, **343,** 347, 351, 352, 353, **354-357,** 358, **359;** Art treasures 342, **344-345,** 353; Income 351, **351;** Interiors 342, **344-345;** Libraries 353, manuscripts **345,** 353
Mystery plays **354-355,** 358
Prayers 342, 351, 358; Prayer devices **336-337,** 338, 342, **344, 350,** 358, **359**
Saints (Masters) 342, 354, 358; Biographies **345**
Spirits 353; Evil 342, 349, 353, 354, 358, exorcism of 351, 353
Lamartine, Alphonse de 800-801
Lamayuru Gompa (lamasery), Ladakh 353, **356-357;** Manuscripts **345,** 353; Offerings, tourist **351**
Lambie, Jack **132**
Lamps, butter 342, **344**
Lancaster, Pa. 754
Lancaster County, Pa. 760
Land claims: Yukon Territory 556, 567-568
Land development: Crocodile habitat lost to 114
Land reclamation: Israel 233, 238; Jordan **244-245;** Pennsylvania **746-747**
Land reform: Mexico 617, 625, 628, 630
Landsat: Imagery 367, 370, **370-371**
Lang, Dan 567
Langley, Samuel Pierpont 819
Larrocha, Alicia de 323
LASH (lighter aboard ship) system 212-213
Lasithi, Crete: Folk dance **147**
Lasithi Valley, Crete: Windmills 172, **173,** 184
La Trémoille, Louis de 803
Latrobe, Pa. 740, 752
Lavenburg, Joseph D., photographer: Portfolio (National Air and Space Museum). June, 825-837
Law of the Sea: Conferences on 503, 507
Laysan Island, Hawaiian Islands **673;** Birds 672, **672, 674,** 676, 1906 photo **672-673;** Rabbits: Damage (pre-1923) 672, extermination of 672; Seals, monk **683**
Lázaro Cárdenas, Mexico: Steelworks 618, 620
Lead and zinc mine: Near Faro, Yukon **560-561,** 569-570
Leakey, Richard 111, 729
Leather: Craftsmen **267;** French firms: Crocodile goods 91, 111
Lebanon: Armenians 869, **870, 871,** civil war, affected by 853, 870, 873, monument **872,** town founded by **868-869**
LeBlanc, Mary Fay 112
Lee, Fernando Edward 254, 256
Lee, Jimmy 200, 220
Leeward Islands (Northwestern Hawaiian Islands): ***Hawaii's Far-flung Wildlife Paradise.*** By John L. Eliot. May, 670-691
Lefeber, Dirk W. 714
Leh, Ladakh **334,** 335, **336-337;** Altitude 337, 349; Bazaar 342, 347, 349; Caravan center, former 337, 346; Population 337
Leme Beach, Rio de Janeiro 269
Lenin, Nikolai 16; Bust 44; Statue 40; Tomb 16, 40
Lepage, Michel 538
Lerner, Jaime **265,** 266
Lesseps, Ferdinand Marie de 280
Levi-Setti, Riccardo 360
Levy, Dennis 570
Lewis, Oscar 639
Li Chi-tao 450
Li Ssu, Prince (China) 452, 459
Liberdade, São Paulo 256
Liberty ship: Sinking of **506**
Librandi, Sam **114**
Light intensifiers 372, 389
Light-water breeder reactor 746
Ligonier, Pa.: Coal mine, one-man 740, 752
Lile, Jimmy 420
Limmen, Netherlands: Tulips 712
Linares, Pedro 664
Lindbergh, Charles 819, 823, 825
Linear A (Minoan script) 151, 174, 175
Linear B (Mycenaean script) 151; Deciphered 174, 181; Tablet **175**
Link, Edwin 527
Lippold, Richard: Sculpture by **822**
Al Lisan Peninsula, Jordan 231, 243
Lissaman, Peter **132**
Little Rock, Ark. 398, 402, 403, **404-406,** 409, 410, 413
Liverpool River, Australia: Crocodile hunting 91
The Living Dead Sea. By Harvey Arden. Feb., 225-245
Living the Good Life in Burgundy. By William Davenport. June, 794-817
Livingston, Margaret Beekman 84
Livingston, Robert 383
Lobamba, Swaziland **50-51**
Lobnoye Mesto, Moscow 16
Lobodinski, S. J. 290
Lock Haven, Pa. 432, 434, 438
Lockheed Petroleum Services Ltd.: Underwater-servicing chambers **504,** 505, **505,** cutaway diagram **505**
Locks: Arkansas River 402, 409; Gulf Intracoastal Waterway 217; *see also* Panama Canal
Loetscher, Ila 222
Logan, Mount, Yukon 567, **577**
Loire (river), France 802
Londrina, Brazil: Plantation 262
Long, Michael E.: ***The Flight of the Gossamer Condor.*** Jan., 130-140; Portfolio (National Air and Space Museum). June, 825-837
Longoria, Octaviano and Jeanette **643**
Lonpo, Rinchen, family **351,** 353
Looms, belt: Mexico **654-655,** 661
The Loop, Chicago, Ill. 469, **482**
López, Conrado 628
López Portillo, José **624,** 625, 633, 640, 644, 646-647; Family **624**
Los Pinos (presidential residence), Mexico City **624,** 633, 644
Lot (Old Testament) 245; Wife 245
Loucheaux Indians: Yukon Territory **556, 557,** 559-561, 564-565
Louis XI, King (France) 806
Louis-Philippe, King (France) 801
Louisiana: Alligators: Auctions 97, 108, 111-112, hunts 97, **108,** 111, 112; ***The Gulf's Workaday Waterway.*** By Gordon Young. Feb., 200-223
Lu Wen-ju 452
Luce, J. V. 180
Luiselli, Cassio 633
Luke, Blaine **752**
Lumber industry: Arkansas 403, 415, **417;** Florida 203
Luna, Juan 289, **289**
Lunar module: Replica **837**
Lungs: Gamma-ray images **375**
Lyndhurst (estate), Tarrytown, N. Y.: Party **78**
Lyubimov, Yury **10**

M

McCarthy, Ed 748-749

Macchi C.202 Lightning (fighter plane) **832-833**
MacCready, Paul B.: ***The Flight of the* Gossamer Condor.** By Michael E. Long. Jan., 130-140
McDonald Creek, Lower, Mont.: Bald-eagle gathering **198,** 199
McDowell, Bart: ***Brazil's Golden Beachhead.*** Feb., 246-277; ***The Panama Canal Today.*** Feb., 279-294
McGovern, James D., Jr. 217
Machado, Carlos Alberto 246
Machaerus (ancient fortress), site of: Jordan 239, 243
Machetes: Jungle clearing 627
Machine politics: Chicago, Ill. 465, 466, 485-486, 492
McIlhenny factory, Avery Island, La.: Tabasco pepper sauce **211**
Mack, Leslie 514
Mackay, John 124
Mackay Falls, New Zealand **125,** 127
MacKinnon, Quintin 127
MacKinnon Pass, Milford Track, New Zealand 117, **120, 122-123, 124,** 129
McKissack, William DeBerry 699
McLaughlin, Robert L. 431, **433**
McLean, Jock 129
Mâconnais (region), France: Vineyards **800-801,** 812
Madden Lake, and dam, C. Z. 283
Madi, Shehab 241
Madrid, Spain 297, 306, 317, 320, 327; Aerial view **318-319;** Election day 330; Graffiti **324;** Military ceremony **300-301, 328-329;** Population 300, 303
Magellan, Ferdinand 309
"Magnificent Mile," Chicago, Ill. 469, **473**
Magnusson, Bill 92, 96
Mahomet, Sallay 583, 590
Maine, Gulf of: Fishing industry **508-509, 512, 513**
Málaga, Spain 306, 315
Malaria 280, 290, 293-294
Malatya, Turkey: Armenians 847
Mallia ruins (palace), Crete 147, 160, 172, 175
Mamet, David 469
Man-Powered Flight at Last. By Michael E. Long. Jan., 130-140
Manatees: Canal Zone, introduced into 294
Maningrida, Australia: Crocodile-research station 92, 96, 97, 98
Manoogian, Alex **856,** 858
Man's New Frontier: The Continental Shelf. By Luis Marden. Apr., 495-531
Mansions: Hudson River 64, 66, **78-79,** 83-85; Mississippi **212,** hurricane destruction **213**
Mantfombi, Princess (Swaziland): ***Zulu King Weds a Swazi Princess.*** By Volkmar Wentzel. Jan., 47-61
Manuscripts: Buddhist **345,** 353; Dead Sea Scrolls 228, 239, **240**
Mapping: Aerial photography 376; Contour 376, human body **363, 365,** 376-377; Moon **384-385**
Maps:
Aegean Sea, locating shipwrecks 772
Alberta, Canada: *Close-up, Canada: British Columbia, Alberta, Yukon Territory.* Apr. supplement
Appalachian Mountains, U. S.: Sailplane flight 434-435
Arkansas 402-403
Armenia: 6th century B. C. to the present 852
Australia: Camel trek 582-583
Brazil, southeastern 257
British Columbia, Canada: *Close-up, Canada: British Columbia, Alberta, Yukon Territory.* Apr. supplement
Burgundy (region), France 798
Canada: *Close-up, Canada: British Columbia, Alberta, Yukon Territory.* Apr. supplement
Chicago, Ill. 468
China: Ch'in Empire 450
Continental shelves: United States 496-498, 510-511, 525
Crete, ancient: Bronze Age sites 149; Minoan palaces 149; Trade routes 154
Dead Sea, and region, Israel-Jordan 231
Greece, ancient: Bronze Age citadels, palaces, and sites 148-149; Trade routes 154
Gulf Intracoastal Waterway, U. S. 206-207
Hawaiian Islands National Wildlife Refuge 674
Hudson River, N. Y. 66-67
Iberia: Linguistic regions 303
Kremlin, Moscow 7
Ladakh (district), India: 1940's and 1960's borders 335
Leeward Islands, Hawaiian Islands 674
Mediterranean Sea: Trade routes, ancient 154
Mexico 620-621
Milford Track, New Zealand 118
Moon 384-385
Moscow, U.S.S.R. 6, 7
New Jersey: *Close-up, U.S.A.: New York, New Jersey, Pennsylvania.* Jan. supplement
New York: *Close-up, U.S.A.: New York, New Jersey, Pennsylvania.* Jan. supplement; Hudson River 66-67
Northeast, U. S.: *Close-up, U.S.A.* series. Jan. supplement
Panama Canal 282-283
Pennsylvania 734-735; *Close-up, U.S.A.: New York, New Jersey, Pennsylvania.* Jan. supplement
Spain 302-303
Swaziland 48
United States: *Close-up: U.S.A.* series: *The Northeast.* Jan. supplement; Continental shelves 496-498, 510-511, 525; Gulf coast 206-207
West Bank (Israeli-occupied Jordan) 231
World: Crocodilian ranges 94-95
Yukon Territory, Canada 550; *Close-up, Canada: British Columbia, Alberta, Yukon Territory.* Apr. supplement
Maracanã stadium, Rio de Janeiro **250-251,** 274
Marajó Island, Brazil: Four-eyed fish **394-395**
Marden, Luis **439; *The Continental Shelf: Man's New Frontier.*** Apr., 495-531
Mardikian, George M. 853
Marinatos, Spyridon 150, 163, 179, 180; Painting of **163**
Markets: Armenian 853, 858, **860-861;** Commissaries: Canal Zone 288, **288,** 289-290; France 796, 799, **802;** Ladakh 346, 347, 349, 358; Moscow 16, 34; São Paulo, Brazil **266-267;** Villahermosa, Mexico 626-627
Marlboro, N. Y: Vineyard near 86
Marquette, Jacques 474
Mars (planet) **387;** Frost 360, **387;** Robot rover 369, **386,** 389
Marshes, tidal: Hudson River 66, **76-77,** 88
Martentz, Martik M., and family 869, 872
Martínez, Juan: Statue **631**
Martínez Manautou, Jorge 640
Marx, Karl: Portrait **18**
Masada (fortress), Israel 231, **234-237,** 238
Masks: Lama **354, 355,** 358; Mycenaean **142-143,** 143, 151, cover ill.; Mayo Indian **660**
Mason, Suzanne **568**
Mastropaolo, Joseph **133**
Masyk, Jim 567
Matador: Spain **320**
Matarazzo, Francisco 256
Matson, Frederick 792
May Day: Moscow **22-23,** 40; Pine Bluff, Ark. **412**
Maya Indians: Mexico: Potters **651,** ruins 627, weavers **654-655**
Maylath, Ronald 76
Mayo Indians: Mexico: Dance mask **660**
Mays, Edward E. **708**
Mdzimba Range, Swaziland **50-51**
Mead, Margaret 383
Meaney, Thomas F. 377
Medem, Federico 97
Medicine and health: Arkansas **412;** Cancer research 81; Nashville, Tenn. 699, 703, 708, **708; *The Wondrous Eyes of Science.*** By Rick Gore. Mar., 360-389
Mediterranean Sea–Dead Sea Waterway (proposed) 230, 233
Meharry Medical College, Nashville, Tenn. 699, 703, 708; Students **708**
Mekhitarist Order: Schools **858-**

859, 870
Meltzoff, Andrew N. 383-384, **388**
Menhaden: Hudson River **66**
Menifee, Ark.: Farm near **407,** 409-410
Mennonites: Pennsylvania 757, 765
Meseta (plateau), Spain 300, 327
Messel, Harry 96
Meteorology: Research photography 360, 376
Metro government: Nashville, Tenn. 695, 706
Mexican Folk Art. By Fernando Horcasitas. May, 648-669
Mexico 390, 579; ***Mexico: "A Very Beautiful Challenge."*** By Mike Edwards. May, 612-647
Beaches 618, 633, 635, **645**
Development programs, government-funded 618, 620, 621, 623
Economy 618, 621, 625, 643, 644, 646; Economic crisis 621, 624, 625, flight of capital 623, 624, foreign debt 623, 624; Inflation 621, 623, 624
Education 618, 620-621, 644
Facts and figures 621
Farms and farming 627; Cattle **626-627;** Cooperative 631; Crops 626, 628, **632-633,** exports 628, 644; Government assistance 630, 631, 633; Production 617, 628; *see also* Land, agrarian, *below*
Federal District *see* Mexico City
Flag **621**
Health care 618, **636,** 638-639; Birth-control programs 636, 640
Highways 617, 623
History: Colonial era 614-615, 618, 621, 638; Independence 631; Revolution 617, 621, slogans 612, 619, 644, veterans **618-619**
Housing, rural 628, 630, 633
Indian heritage 615, 617-618, 626, 638
Indians 615, 617, 618, 626, 638; Monument honoring **622**
Industry 625, 628, 641, 644; Automobiles **613,** 618; Glass worker **629;** Steelmaking 618, 620
Irrigation 628, 631, 633; Districts, map of 620
Labor force: Migrant farm workers 621, 628; Unemployment 621, 633, 635, 644
Land, agrarian 628; Invasion of 612, **616-617,** 617, 631; Redistribution programs 617, 625, 628, 630
Languages 617, 638
Map 620-621
Natural resources 617, 621, 646
Oil 617, 625, 646; Fields 620, 625, map 620-621; Reserves 620, 621, proven 625, 641
Population 621; Age 618; Growth rate 621, 640
Poverty: Cities 644, slum **637,** 638-639; Rural areas 628, 630-631, 635, 636, 638
President *see* López Portillo, José; Official residence **624,** 633, 644; Term of office 647
Terrain 617; Map 621
Tourists 618, 635; Accommodations 635, **644, 645;** Importance to economy 635, 644
see also Mexican folk art
Mexico, Gulf of: Currents: Infrared image **370;** Interface experiment **502-503;** Oil and gas 510, production structures **501, 504, 505;** *see also* Gulf Intracoastal Waterway
Mexico City, Mexico **612, 622-623,** 636, 638, 639, 644; Mayor 636; Population 623, 636, 638; Satellite city **637,** 638-639
Mexico–United States border 200, 201, 220, 222; Illegal crossings 579, 623, **635**
Miami Serpentarium, Fla.: Crocodile, man-killer 110
Miben mine, Klondike District, Yukon **572,** 578
Michael, Saint: In art **30**
Michigan, Lake, U. S. 460, 464, 473, **473,** 474, **477,** 479, 483-484
Michoacán State, Mexico 618, 649
Microorganisms, halophilic: Dead Sea 230, 233
Microwaves: Uses **368-369**
Middle America *see* Mexico
Middle East: Minoan civilization, influence on 164, 167, 169, 172, 181; *see also* Dead Sea
Middleton, Delmar 415, 420
Midwest (region), U. S.: Bald-eagle wintering 198; *see also* Chicago, Ill.
Midwife: Mexico **636**
Miéral, Roger 802
Mies van der Rohe, Ludwig 483; Building designed by **475**
Mikhalchenko, Alla 38, 44, **45,** cover ill.
Milford Sound, New Zealand 127, **128-129**
Milford Track: ***New Zealand's Milford Track: "Walk of a Lifetime."*** By Carolyn Bennett Patterson. Jan., 117-129
Bridges, swinging **116,** 121, 124, 129
Hikers and hiking **116, 118,** 121, **122,** 123, **124, 128;** Number limited 117, 118; Organized 117, 118
Hotel 127, **129**
Land formations **116,** 117, **118-119,** 121, **128-129**
Length 117, 118
Lodges 117, 118, **119,** 121, 122, 123, 124, **124,** 127, 129
Map 118
Pass 117, **120,** 122, **122-123,** 127
Rain forests 117, 121, 122, **122-123, 126**
Trails **118,** 121, **122-123, 126**
Vegetation 117, **120,** 121, **122-123, 126,** 127
Waterfalls **116,** 117, 118, 121, 123, 124, **125,** 127
Wildlife 117, 118, **118, 120,** 121, 127
Military police, U. S.: Canal Zone 290
Miller, Eric 88
Miller, Mark: Vineyard 86, 88
Milton, Katharine **288**
Minerals: Bauxite 407; Bromine 228, processing plant **229;** Magnesium 228; Potash 228, shipment **228-229**
Mines (explosives) 208; Countermeasures 204
Mines and mining: Bauxite 407; Continental shelves 507; ***Yukon Fever: Call of the North.*** By Robert Booth. Apr., 548-578
Miniature artwork **661, 863**
Minnesota: ***Our Bald Eagle: Freedom's Symbol Survives.*** By Thomas C. Dunstan. Feb., 186-199
Minnie Pearl 696, **700**
Minoan civilization: ***Minoans and Mycenaeans: Greece's Brilliant Bronze Age.*** By Joseph Judge. Feb., 142-185
Art **144,** 146, 147, **168, 172,** 175, **178-179,** 179, 182; Frescoes **157-159,** 160, **161,** 163, **168-169, 171,** 180; Pottery 146, **146,** 147, **152, 153,** 172, 180; Statues **150, 171,** 172
Bull cult 164, 166, 172; Myth 150-151, 164; Sacrifice **164-165**
Bull sports 146, 160, 164; In art 160, **168-169**
Burial sites 150, 164, 166, 175
Culture 144, 146, 151, 172; Daily life 175, 178
Destruction of 152, 154, 176, 183; Possible causes 147, 163, 178-179, 180-181, disputed 180
Duration 144, 146, 152, 172, 183
Government 182
Houses 144, 146, **163,** 169, 178; Plaques depicting **144**
Jewelry 147, 166-167, **178-179**
Maritime empire 146, 154, **157-159,** 172, 175, 184; Trade routes: Map 154
Mythology 150-151, 164, 168, 184
Palaces 148, 150, 160, 164, 172, 175, **176-177;** Knossos **145, 148,** 151, 152, 160, 172, 180, frescoes 160, **168-169, 171,** reconstruction 148, 152, 160, throne room 147, 160, **170;** Map 149
Religion 150, 160, 164, 167, 171, 172, 175, 184; Snake goddess 146, **150**
Sealstones 151, 160, 172; Impressions from **171, 174**
Settlements excavated 150, 169, 172, 175, 178, 179, 180, 184

Ships 154, 159; Fresco of **157-159**
Successors *see* Mycenaean civilization, *outlined*
Symbolism 160, 164, 171, 172
Women's dress 146, **150,** 160, 166, **178-179**
Writing systems 151, 174, 175; Phaistos Disk **174**
Minos, King (Greek mythology) 142, 150-151, 164, 168, 172, 184
Minos, Palace of *see* Knossos ruins
Minotaur (monster) 150-151, 168, 184
Miraflores Locks, Panama Canal **284,** 294
Mississippi: Mansion **212,** hurricane destruction **213**
Mississippi (river), U. S. 212, 214; Bald-eagle winter roosts 198
Mitchell, William (Billy) 828
Mizpe Shalem (Israeli settlement), West Bank **236**
Moab (ancient land) **226-227,** 228
Mobile, Ala. 208-209, 212
Mobley, George F., photographer: ***The Panama Canal Today.*** Feb., 279-294; ***Yukon Fever: Call of the North.*** Apr., 548-578
Moctezuma, Juan Cano 330
Moghraby, Asim el 111
Moize, Elizabeth A.: ***Tulips: Holland's Beautiful Business.*** May, 712-728
Mollusks 506, **685;** Abalone **501,** aquiculture experiment **499-500;** Mussels 501, 506; Snails **523,** 803, **810**
Monasticism *see* Lamaism; *and* Burgundy, France
Monomakh, Cap of **27**
Monongahela (river), Pa. 736, 737, **756-757**
Montalvo, Protasio **325**
Montejo de la Vega de la Serreezuela, Spain 322
Monterrey, Mexico: Factory worker **629;** Industry 628, 641, 644; Technical institute 644
Montgolfier, Elie de 808
Moon, Sun Myung 85
Moon: Chemical composition 368, 385; Maps, gamma-ray and gravity **384-385**
Moors: Spain 299, 305, 307
Moraine State Park, Pa.: Boy Scout Jamboree (1977) **746-747**
Moreau, Jeanne 469
Morgan City, La. 218-219
Morgenthau, Henry 862
Morlin, R. Trevor 349
Morocco 303; Spanish enclaves 306
Morvan (park), France 810
Moscow, U.S.S.R. 1; ***The City Around Red Square: Moscow.*** By John J. Putman. Jan., 2-45
The arts: Ballet 16, 38, 44, **45,** cover ill.; Music 15, **20;** Painting **11,** 24, 34; Poetry 24, poet **8,** 24; Theater: Director **10**
Cathedrals and churches **5,** 9, **22, 28, 29,** 33, **38-39**
Children 15-16, **20, 21, 42**
Elections **18, 19,** 44
History 7, 16
Housing 7, 9, 15, 20, 38, **38-39,** 44; Prefabricated 9, **36-37**
Industry 9; Automobile **17**
Labor shortage 7, 9, 37, 38
Mayor 7, **7,** 9
Museums **5, 6, 11,** 40; Collections **25-32**
Newspapers **19,** 34, 40, 44
Parks **2-3,** 7, **12-13, 15**
Political dissidents 20
Population 7, 9
Recreation **2-3,** 7, **12-13, 15, 42**
Restaurants **8,** 34
Satellite communities 9
School system 15-16, **20, 21**
Sports **2-3,** 7, **12-13,** 15-16, **21, 41**
Standard of living, rising 2, 7, 20, 34
Stores and markets 34, **35,** 36
Subway system 9, **43**
Winter **2-3,** 7, **12-15, 36,** 38, **41**
Moscow River, U.S.S.R. 2, 7, 40; Trade center 9
Moscow State University 7, 36
Moskvich subcompacts (cars) **17**
Mosquitoes: Disease carriers 290, 293-294; Larvae 294
Motley, Willard 484
Motorcycles: Spain 315, **316, 317**
Mount Li, China (burial mound): ***China's Incredible Find.*** By Audrey Topping. Apr., 440-459
Mount Juliet, Tenn. 706
Mountain View, Ark. 423; Caverns near **422**
Mud, Dead Sea: Curative powers 238
Mugger crocodile **94,** 97, 101
Muhammad, Elijah 484
Muhammad, Wallace D. 484-485
Mulholland, George T. 381
Mummers: Philadelphia, Pa. **738**
München (trawler) **508-509**
Museums: Herakleion, Crete 147, artifacts **144, 146, 150, 152, 168-169, 171, 174, 178-179;** Mexico City: Shop 669; São Paulo, Brazil **274;** *see also* Kremlin Armory; National Air and Space Museum
Mushrooms: Kennett Square, Pa. 760; Spain 300
Music and musicians: Arkansas **405,** 413; Brazil **262,** 273; Chicago, Ill. **472, 478-479;** Moscow: School 15, **20;** New Orleans, La. **215;** Spain 323, **323;** ***There's More to Nashville than Music.*** By Michael Kernan. May, 692-711
Muskrat trapping: Yukon Indians **556,** 560, 564, 565
Muslims: Moors 299, 305, 307; Turkey 846, 852, 853
Mutations: Tulips 719, **719,** 725, **725**
Mycenaean civilization: ***Minoans and Mycenaeans: Greece's Brilliant Bronze Age.*** By Joseph Judge. Feb., 142-185
Artifacts **142-143,** 148, 151, 181, **182-184,** cover ill.
Duration 148, 181, 183, 184
Fortresses: Map 149; Mycenae, ruins of 151, 181, **185,** citadel reconstructed (drawing) **149**
Government 148, 182
Graves 151, **185;** Burial goods *see* Artifacts, *above*
Greeks, relation to: Theories: Current 181, former 151-152
King, legendary *see* Agamemnon
Ships (painting) **154-156**
Succeeded Minoans 143, 154, 163, 174, 179, 180-181, 183; Former theories 151, 174, 181
Trade 154, 181; Routes, map 154
Wars 149, 151, 154, 181, 182, 183, 184
Weaponry **182-183**
Writing system: Linear B 151, 174, 181, tablet **175**
Myrtos, Crete: Minoan settlement 169, 172
Mystery plays: Lamaism **354-355,** 358
Mythology, Greek 150-151, 164, 167, 168, 181, 184

N

NBC television special: Taping of **700-701**
Nack, Everett 73-74
Nahua Indians: Mexico 661, bark-paper painting **657**
Nahuatl (language) 617, 635
Nalbandian, Al **857**
Naltchayan, Harry N., photographer: ***The Proud Armenians.*** June, 846-873
Naltchayan, Vartan 873
Nantucket Shoals, Atlantic Ocean: Oil spill **516-517**
Narcotic plants: Australia 595
Nashville, Tenn.: ***There's More to Nashville than Music.*** By Michael Kernan. May, 692-711
Aerial view **694-695**
Architecture 692, **694-695,** 696, **701,** 704, 706, 709
Blacks **695,** 699, 706-707, **708-709,** 709
Business and industry 692, 694, 699, 702, 703, 704, 706, **706,** 709 *see also* Entertainment industry, *below*
Churches 692, 699, 704
Cultural centers 706, 709
Development 692, 696, 699, 701, 704, 706
Educational institutions 692, 699, **700,** 703, 707, 708; Students **708-709**
Entertainment industry 692, 694, 696, 699, **700-701,** 701, 709, 710, 711
History 699, 702, 709
Metropolitan area: Metro government 695, 706, mayor 692, **694;** Population 695, blacks,

percentage of 706; Unemployment rate 706
Musicians **693,** 694, **697, 698,** 699, **705,** 709-711, **710-711**
Parks 696, 701, **704,** 709
Nashville, U.S.S. 280
Natal Parks Board: Crocodile-behavior study 102, 103, 108
National Air and Space Museum, Washington, D. C.: ***Of Air and Space.*** By Michael Collins. June, 819-823; Photographic portfolio. Text by Michael E. Long. June, 825-837
Aircraft 819, **819-821,** 822-823, **824-827, 832-833;** Repair shop 822
Architect 822
Building 822, **822;** Size 825
Director 819
History 819, 822, 823
Movie theater 823, **830-831**
Opening date 819, 823
Planetarium 823
Spacecraft and rockets **818, 819,** 822, 823, **834-837**
Visitors: Number of 819, 823
National Environmental Policy Act (1969) 70
National forests: Chippewa, Minn. *see* Bald eagle
NATIONAL GEOGRAPHIC:
Anniversary, 90th 1
Articles, past 1, 141, 439, 579, 853
Editorial policy, reaffirmation of 1
Editorials 1, 141, 195, 439, 579, 729
National Geographic Society:
Board of Trustees: Chairman 1
Books *see* Books, NGS
Committee for Research and Exploration 729
Grants: Bald-eagle research 190; Camel trek 583; Nautical archeology 729, 768, 774
Medals: Special Gold Medal 141
President 1
Science program presented to the American Association for the Advancement of Science 295
National High School Championship Rodeo: Sulphur, La. **205**
National historic sites: Vanderbilt estate, Hyde Park, N. Y. **78-79**
National Life and Accident Insurance Company 694, 701
National Marine Fisheries Service (NMFS) 515, 518, 684
National Movement: Spain 297, 322, abolished 297, 324
National Oceanic and Atmospheric Administration (NOAA): Satellite imagery **370**
National parks: Glacier, Mont. **198,** 199; Hot Springs, Ark. 415
National seashore: Padre Island, Texas 220
National Trust for Historic Preservation: Mansions **78,** 83-84
National wildlife refuges: Aransas, Texas 220, 222; *see also* Hawaiian Islands
Nationalists: Spanish civil war 303, 325, 327
Natural gas: Alaska–Canada pipeline (1981) 550, 559, controversy 559, map 550; Continental shelves 495, 496, 498, 507, 510; Mexico 621, 625, flares 625, 626, **641;** Tanks **72-73**
Natural resources: ***The Continental Shelf: Man's New Frontier.*** By Luis Marden. Apr., 495-531
Nature Conservancy's Illinois Chapter: Eagle-roost preservation 198
Naval Coastal Systems Laboratory, Fla. 204
Nebbia, Thomas, photographer: ***Mexico: "A Very Beautiful Challenge."*** May, 612-647
Necklaces: Gold: Minoan 166; Lion-claw **56;** Silverwork **653**
Needham (research vessel) 63, 74
Neolithic settlement: Crete 169
Nepal: Gharial 100
Nepalese artwork, 17th-century **344**
Nestor's Cup **184**
Netherlands: ***Holland's Beautiful Business: Tulips.*** By Elizabeth A. Moize. May, 712-728
Netzahualcoyotl, Mexico **637,** 638-639
Neurology: Computer imaging **374-375,** 383
Neutrinos 367, 381
Neutrons 380
New England: Fishing industry **512,** 513, **513**
New Guinea crocodile **95,** 101
New Holland, Pa.: Horse auction **764-765**
New Jersey: ***Glittering Cities, Lonely Wild Lands.*** Jan. supplement
New Market, Philadelphia, Pa. **741**
New Orleans, La. 203, 204, 208, 209, 212, 213, **214-215,** 217
New Stanton, Pa.: Volkswagen factory 746
New Year's Eve: Rio de Janeiro 274
New York: Crocodilian goods: Ban on 111, confiscation of **114;** ***Glittering Cities, Lonely Wild Lands.*** Jan. supplement; *see also* Hudson River
New York, N. Y. **89,** 465, 466, 469, 487, 490; Drinking water: Potential source 81; Harbor cleanup **72;** Sewage: Plant **87,** ship **520**
New York Bight, Atlantic Ocean: Pollution 510, **520,** 521, **521,** 524
New York Central (railroad) 78
New York *Globe:* Political cartoon **279**
New Zealand's Milford Track: "Walk of a Lifetime." By Carolyn Bennett Patterson. Jan., 117-129
Newburgh, N. Y. 66; Junked cars **72-73**
Newe Zohar, Israel: Sulfur springs 238
Neyaz, Hajji Tokta 346-347
Niagara (ship): Erie, Pa. 754
Nicholas II, Tsar (Russia) 24
Nicola, Norberto 256
Niemeyer, Oscar 248
Niépce, Joseph **368**
Nieuport 83 (biplane) 823
Niger: Crocodile habitat destroyed 91
Nihoa (island), Hawaiian Islands **674;** Birds 674
Nile crocodile: ***A Bad Time to Be a Crocodile.*** By Rick Gore. Jan., 90-115
Ninkovich, D. 180
Niterói, Brazil 248
Njootli, Grafton 565
Nobel Prize winners: Chicago, Ill. 469, 471, 473
Noblet, André **796,** 815
Nongoma, South Africa: ***Zulu King Weds a Swazi Princess.*** By Volkmar Wentzel. Jan., 47-61
Noone, Rose Anne 88
Norberto, João Batista 262, 263
Norden bombsight: Prototype **833**
North America: Termites 539-540; *see also* Mexico; United States; Yukon Territory
North Bay, Hudson River 88
Northeast, U. S.: ***Glittering Cities, Lonely Wild Lands*** (New York, New Jersey, Pennsylvania). Jan. supplement; *see also* Hudson River; Pennsylvania
Northrop Alpha (aircraft) **821**
Novaculite: Arkansas 420
Novosti Press Agency 9, 40, 862
Nuclear fusion: Photographing of 360
Nuclear power plants: Brazil 251, 257, **260;** Indian Point, N. Y. **86;** Pennsylvania 743, 746, 766, light-water breeder reactor 746

O

Oak Park, Ill. **480-481**
Oak Ridge, Tenn.: Railroad bridge near **434,** 435-436
Oakes, Robert S., photographer: Portfolio (National Air and Space Museum). June, 825-837
Oaklawn Jockey Club, Hot Springs, Ark.: Bettor **415;** Horses **414,** 420
Obata, Gyo 822
O'Brien, Michael 518
O'Brien, Richard 72
Ocean currents: Subsurface eddies 367
Oceanography *see* Continental shelf
Octagon House, Irvington, N. Y. 83-84
Octopus **777,** 786, 792
Ocumicho, Mexico: Pottery **648-649,** 649-650
Of Air and Space (National Air and Space Museum). By Michael Collins. June, 819-823

O'Hare International Airport, Chicago, Ill. **493**
Ohio (river), U. S.: Source 736, **757**
Oil: Gulf of Mexico 203, 220, 222, supplies for 204, 219; "oil farms": Israel 233; Transport 203, 204, 218, 292, 293, 294; *see also* Continental shelf; Mexico; Pennsylvania
Oil spills: Hudson River **84-85**; Nantucket Shoals, Atlantic Ocean **517**
Oilstones: Arkansas 420
Oklawaha River, Fla.: Alligator attack 112
Olana (Moorish mansion), Hudson, N. Y. 83
Old Crow (village), Yukon 559-560; Isolation of 556, 559, 570
Old Crow Flats, Yukon **556-557**, 560, 561, 564-565
Old Testament: Dead Sea Scrolls 228, 239, **240**
Oldenburg, Claes: Sculpture by **474**
Oldershaw, Vern **140**
O'Leary, Carol 88
Olga, Mount, Australia **584-585**
Olímpia (favela), São Paulo, Brazil 261
Olinalá, Mexico: Lacquerwork 667, **668, 669**
Olive gatherers: Crete **166-167**
Olympic games: First (776 B.C.) 152; Gold medal winner, U. S. (1960) **695**; Moscow (1980) 7, 20
Omo River, Ethiopia: Crocodile attack 111
O'Neill, Thomas: ***The Four-eyed Fish Sees All.*** Mar., 390-395
Open-pit mining: Yukon Territory **560-561**, 569, 570
Orb, jeweled **30**
Orchids: *Epistephium mardeni* 439
O'Rear, Charles, photographer: ***The Gulf's Workaday Waterway.*** Feb., 200-223
Oregon: Bald eagles **188-189**
Orinoco crocodile **94**, 97
Orla, Ted 263
Orteig, Raymond 815, 825
Ostrich feathers **58, 59**
Otomí Indians: Mexico 658, 661, healing ceremony **656**
Ottoman Empire: Armenia, conquest of 852; World War I 849, 852, 862, Armenians, purge of 846, 849, 851, 852-853, 862, treaty terms 862
Ouachita, Lake, Ark. 407-408
Ouachita Mountains, Ark.–Okla. 396, 402, 415, 420
Our Bald Eagle: Freedom's Symbol Survives. By Thomas C. Dunstan. Feb., 186-199
Our Lady of Guadalupe, Basilica of, Mexico City 638, 640
Our Lady of Remedies, Church of, Cholula, Mexico **615**
Our Lady of Solitude (image): Seville, Spain 305
Our Lady of the True Cross (brotherhood): Valladolid, Spain 300
Outback, Australian: ***Alone Across the Outback.*** By Robyn Davidson. May, 581-611
Ovid (Roman poet): Quoted 506
Owassee Rapids, Pine Creek, Pa. 748-749
Owens, Jim 407, 409
Ozark Crafts of Christmas program: Little Rock, Ark. **405**
Ozark Plateau, Ark.–Mo. 402, 403, 413, 420, 423; Residents 396, **397**, 415, 417, **420, 421**, 423, 426

P

P-51 Mustang (aircraft) **833**
PCB's 76-77, 81
Pacaud, Paul 796, 799
Padre Island, Texas 206, **221**, 222; National seashore 220
Page, Sir Denys 180
Paintings: Australian Aborigines' **97**; Frescoes: Kremlin **28, 29**, Minoan **157-159**, 160, **161**, 163, **168-169, 171**, 180; Pennsylvania artists **750, 751**
Palaces: Ancient China 452, 455; Dijon, France 803; ***Minoans and Mycenaeans: Greece's Brilliant Bronze Age.*** By Joseph Judge. Feb., 142-185; Spain **319**, 322
Palisades, N. J.–N. Y. **68**, 88; Park 68
Palma, Barbara **744, 745**
Palmer, Leonard 169
Palmore, Tom **750**
Pamirs (mountains), Asia: Tulips from **724**
Pan American Highway: Proposed route 283
Panama 141; ***The Panama Canal Today.*** By Bart McDowell. Feb., 279-294
  Commander-in-Chief *see* Torrijos Herrera, Omar
  Government, overthrow of 288
  Independence 280
  Plebicite 288
  Railroad 280, 282, 283
  Sovereignty: Panama Canal 279, 283
  Treaties *see* Canal Zone
Panama Canal 141; ***The Panama Canal Today.*** By Bart McDowell. Feb., 279-294
  Construction 279, **286-287**, 289; Chief engineer 289; Cost 281; Duration 279, 287; French effort 279, 280, 281, 287, 290, 293, lives lost 280, 290, 293; Medical challenge 280, 290, 293; Rock excavated 287
  Financial status: Deficit 290; Money-maker 290, 292
  Length 279
  Locks 281, 282, 283, **284**, 287, 289, **293**, 294; Control-house operators **284**, 289; Gates **278**, 287, 288; Number of 285; Size 290, 292, 293; Water supply 285, 287, 294
  Maintenance: Dredging 294
  Map 282-283
  Military transports 281, 290, 293
  Opening 281, 282
  Pilots 279, 281, 284, **285**, 287, 290, 294
  Superships too large for passage 290, 292, 293
  Towing of ships: Locomotives 287, 290; Tugboats 287
  Traffic 279, 281, **281, 284-286**, 287, 290, **293**, 294; Night 292; Ships: Number of 281, 282, tonnage 292
  Transit time 279, 285, 294
  U. S. defense of Canal 283, 293
  Water level, highest **280-281**, 285, 287
Panama Canal Company: Apprentice program 289, **289**; Commissaries 288, **288**, 289; Head of **288**
Panama City, Fla. 204; Pier **202**
Panamanians: Canal Zone 279, 287, 288, 289, **289**, 290
Paper, bark: Buddhist manuscript **345**, 353; Mexico 657, 658, 661
Paper mill: Hudson River pollution 70, 72, control 72
Papier-mâché work: Mexico 664-665, **664, 667**
Parades: Dawson, Yukon **574-575**; Holy week: Spain **296**, 300, Moscow **22-23**, 40; Philadelphia, Pa. 738, **738**; Rio de Janeiro 246, **254-255**, 269, 276; St. Patrick's Day: Chicago, Ill. **467**
Paraguay–Brazil border: World's largest power-generating project 250, 257
Paraná (state), Brazil: Agriculture **272-273**, coffee 246, 262-263; Capital *see* Curitiba; Freeze (1975) 262; Map 257
Paraná River, South America: Hydroelectric project 250
Paranaguá, Brazil: Port 267
Pardo Palace, Madrid 322
Parfitt, Harold R. **288**, 290
Paris, France: Crocodile-skin market 91, 111
Park, international: Trail of '98 (Canada–U. S.) 572
Parker, Ian 111
Parker, Isaac 420
Particles, subatomic 369, 380-381; Bubble-chamber tracks **366, 369**, 381
Parton, Dolly **698**
Pass Christian, Miss.: Mansion **212**, hurricane destruction **213**
Patriarche (wine firm), France 816
Patterson, Carolyn Bennett **124**; ***New Zealand's Milford Track: "Walk of a Lifetime."*** Jan., 117-129
Patuxent Wildlife Research Center, Md.: Bald eagles **199**
Payne, Melvin M. 1
Pearl High School, Nashville, Tenn. 707
Pearls: Russian cassock **32**
Pearson, Art 559
Peçanha da Silva, Ivonilda 269,

276
Pediatrics 360, 383-384, **388**
Pedro Gastão de Orleans e Bragança, Dom 248, 269
Pelaghi, Clarence 742-743
Pelly River, Yukon **566,** 571
Pelly River Ranch, Yukon **566-567,** 571, 574
Pelsor, Ark.: Farm near 423
PEMEX (Petróleos Mexicanos) 625-626
Peña, Faustino **651**
Penn, William 731, 736, 754; Statue **730**
Pennsylvania: ***Glittering Cities, Lonely Wild Lands.*** Jan. supplement; ***Pennsylvania: Faire Land of William Penn.*** By Gordon Young. June, 731-767
Air pollution 737, 756; Clean-up 737, 745, 756, 758
Amish 754, 756-757, **764-765,** 765
The arts 736, **750, 751**
Capital *see* Harrisburg
Coal 731, 737, 738, 766; Laws concerning 738, 740, 747; Map 734-735; Mines 738, 740, one-man 740, 752, strip mines 738, **747;** Reclaimed land **746-747**
Economy 734, 737, 745; Layoffs 737, 745, 766
Facts and figures 734
Farms and farming **732-733,** 734, 754, **755,** 760, **767;** Crops 754, 760
Flag **734**
Forests **732-733,** 754, **755, 762-763**
Government 764-766; Governor 764-765
History 731, 733, 734, 735, 740, 749, 752, 753-754, 757, 760
Industry 731, 734, 742-743, 746, 766 *see also* Coal, *above;* Oil; Steel industry, *below*
Map 734-735
Name: Meaning 748; Origin 731
Oil 740, 742-743, **752,** 766; First well in U. S. 734, 740; Storage tanks **742-743**
Parks 736, **746-747,** 753
Population 734; Ethnic diversity 734, 737, 745, 754, 756-757, 758, **764-765,** 765
Power plants 766, **767;** Nuclear 743, 746, 766
Railroads 737, 749, 752-753, 754, 765
Steel industry 731, 734, 737, 738, 745; Layoffs 737, 745, 766; Workers **744, 745**
Tourism 736; Tourist attractions 736, **738, 739,** 749, 754, 760, 763
Transportation 731, 749, 752-753; Highway network 753; *see also* Railroads, *above*
Pennsylvania Academy of the Fine Arts, Philadelphia 736; Painting in **751**
Pennsylvania Dutch 754, **764-765,** 765
Pensacola Bay, Fla.: Catamaran **220-221**
Pepper: Harvesting **232-233;** Tabasco sauce production **211**
Perch: Hudson River 64, **67**
Percy Warner Park, Nashville, Tenn. **704,** 709
Pereira da Silva, José 269
Peroblasco, Spain 321
Perry, Oliver Hazard 754
Pershing, John J. 579
Peso, Mexican 624; 1976 devaluation 621, 625
Peter the Great, Tsar (Russia) 16, 27; Cap of **26**
Peters, David **110**
Petrochemical complex: Texas **223**
Petróleos Mexicanos (PEMEX) 625
Phaistos Disk **174**
Phaistos palace ruins, Crete 147, 164, 172, 175, **176-177,** 180
Pheromones: Termites 532, 534, 537, 538, 543
Philadelphia, Pa.: ***Pennsylvania: Faire Land of William Penn.*** By Gordon Young. June, 731-767
The arts 736, **750,** 751, **751**
City Hall **738;** Statue atop **730**
Festivals **738, 739**
History 731, 734, 738
Mayor 731, 736
Neighborhoods 736, 740, **741**
Nickname 731, 736
Population 734
Port 736, 743, 753
Tourism 736; Tourist attractions 736, **738, 739**
Urban renewal 736, **741;** Homesteaders 736; Squatters **740**
Philadelphia Orchestra 736
Philhall Corporation, Nashville, Tenn. 704
Philip II, King (Spain) 327
Phillips, Don 760
Photography and other imaging techniques: ***The Wondrous Eyes of Science.*** By Rick Gore. Mar., 360-389
Aerial photography 376
Astronomy **361-362,** 364, **368-369,** 372
CCD's (charge-coupled devices) 364, **383, 384,** 386, 389
Computer applications: Contour maps 376, human body **363, 365,** 376-377; Imaging **372, 374-375,** 383
Cosmic-ray imaging 376, **376**
Fiber optics 379
Gamma rays: Imaging 368, **375;** Lunar mapping **368, 384-385**
High-speed photography 360, 364, **378, 379,** 384, 389
Holography 369; Acoustic **375**
Infrared imaging **368-369, 370**
Medicine and health 379; Biostereometrics 365, 377; Computer imaging **364, 365, 372, 374-375,** 383; X rays **360, 368,** cross-sectional **372,** 377, substitutes **375,** 379
Micrographs **381;** Electron 364, **368, 373,** 379, 380
Photoreduction 367
Polarized light **360, 369, 381**
Satellites **370;** Landsat 367, 370, **370-371**
Social sciences 383-384, **388**
Solid-state imagers *see* CCD's, *above*
Ultraviolet imaging **368-369,** 381, 389; Flowers **380,** 389; Insects 364, 389
X rays *see* Medicine and health, *above*
Photons 372, 389
Piano factory: Moscow 37-38
Picasso, Pablo 315
Pichler, Hans 180
Pickle company: Arkansas **416**
Picos de Europa, Spain **310-311,** 322
Pierce, Webb **697**
Piercy, Robin 774-775, 786, **793**
Piermont, N. Y.: Hudson River marsh **76-77**
Pilgrims: Ladakh 358, **359;** Lenin's tomb 16; Mexican shrine 658
Pilots *see* Panama Canal
Piñar, Blas 322
Pine Bluff, Ark. 396, 402, **412,** 413
Pine Creek, Pa. 748-749, **762-763**
Pine Ridge, Australia: Rock formation **604**
Pinocchio: Children's theater **405**
Pinto, Augusto Procopio, and family 261, **268**
Pions 380; Bubble-chamber track, possible **366**
Pipefish, ghost 845, **845**
Pipelines, natural gas: Mexico 641; Yukon Territory: Proposed 550, map 550
Pitcairn Mailwing (aircraft) **821**
Pitchers: Glass **784;** Metal **652**
Pithoi 151, **153,** 160
Pitjantjatjara tribe: Australia 586, 595, language 586, 590, 595
Pittsburgh, Pa. 736-737; Aerial view **756-757;** Air quality, improvement in 737, 756; Bars 737, **745;** Neighborhoods 736-737, **758-759;** Steel mills 737
Pittsburgh History & Landmarks Foundation: Restoration project **758;** Vice-president 737, **758**
Plachy, Kevin 383
Planetarium: National Air and Space Museum, Washington, D. C. 823
Plankton 517; Food chain 511, 514, 524
Plasencia, Spain: Fiesta 327
Platanal 71 (oil well), Reforma field, Mexico 625
Plate tectonics: Continental shelves 502, 511, 524
Platon, Nicolaos 150, 175
Plaza de España, Madrid **318-319**
Pleasantville, Pa. 766
Poaching: Crocodilians 97, 107, 111; Fish 413; Plume hunters (early 1900's) 671
Pocono Mountains, Pa. 760
Podgorny, Nikolay 17, 40

Point Loma, U.S.S. 141
Polarized light: Photography **360, 369, 381**
Policía Armada: Spain 312
Pollination: Tulips 719, **719**
Pollution: Chicago, Ill. 473, control 474, 479; Pennsylvania: Cleanup 737, 745, 756, 758; São Paulo, Brazil 254; *see also* Water pollution
Polychlorinated biphenyls (PCB's) 76-77, 81
Polygamy: African tribes 49
Pomar, María Teresa 669
Ponies, wild: Spain **312-313**
Pooley, Tony 102, 108
Pools: Guitar-shaped: Nashville, Tenn. **696-697;** Open-air heated: Moscow **41**
Popocatépetl (volcano), Mexico **614-615**
Porcelain, Chinese: Islamic imitation **791,** 792
Porcupine **552**
Port Arthur, Texas 203, 216, 220
Porter, Keith 379, 380
Portuguese immigrants: Brazil 258-259, **266-267**
Potash: Israel 228, shipment **228-229**
Potlatch Corporation: Warren, Ark. **417**
Pottery: Crete **152;** "glass wreck" 787, **790, 791,** 792; ***Mexican Folk Art.*** By Fernando Horcasitas. May, 648-669; Minoan 146, **146,** 147, **152, 153,** 172, 180
Pottsville, Pa. 738
Pouncey, Bert **398**
Power plants: Brazil 250, 251, 257, **260;** Hudson River 64, 67, 69-70, **86;** Pennsylvania 743, 746, 766, **767**
Powers, Francis Gary 834
Praisos, Crete 184
Pravda (newspaper) 19, 40; Editorial board **18-19,** 40, 44
Prayer devices: Lamaism **336-337,** 338, 342, **344, 350,** 358, **359**
Predation: Value of 97
Prefabricated housing: Moscow 9, **36-37;** Safi, Jordan **242-243**
Preservation Hall Jazz Band: Trombone player **215**
Presley, Elvis 694; Pinup of **706**
Pressure suits: Diving **494,** 531; High altitude **834**
Preston, Frances 699
Prestwich, Glenn D. **535;** ***Termites: Dwellers in the Dark.*** Apr., 532-547
Prier, Inga 288-289
Primrose willow: Flower **380**
Promyslov, Vladimir 7, **7,** 9
Prosdocimo, Marise **263**
Prospectors *see* Yukon Territory
Protons 367, 380; Bubble-chamber tracks 381
The Proud Armenians. By Robert Paul Jordan. June, 846-873
Prudhoe Bay, Alaska: Natural-gas pipeline (1981) 550, 559, map 550
Pryor, David 407-408, 409, 420
Psychology: Photography, use of 383-384, **388**
Publishing industry: Nashville, Tenn. 692, 703-704, 706, **706**
Puebla, Mexico 636; Volkswagen plant **613**
Puffin (man-powered aircraft) 135
Puffin II (man-powered aircraft) **135**
Pulitzer Prize winners 484, **484,** 490, **856,** 861-862
PUSH (People United to Save Humanity) members **486-487**
Putman, John J. 1; ***The City Around Red Square: Moscow.*** Jan., 2-45
Pylos ruins, Greece 151; Linear B tablets 151, **175,** 181
Pyramid of Chephren: Cosmic-ray study 376; Diagram **376**

Q

Quakers: Pennsylvania 731, 736, 754
"Quapaw Quarter," Little Rock, Ark.: House renovation **406**
Quarks 380-381
Queensbury, N. Y.: Water supply 82
Queensland, Australia: Crocodiles, man-killing 96
Qumran, Wadi, West Bank **240-241**

R

RCA: Electronics research 364, 383, 389; Vice-president **710**
Rabbit Creek (Bonanza), Yukon: Gold find 558
Rabbits: Laysan Island, Hawaii, exotics (early 1900's) 672
Radio, two-way 586, **601**
Radio astronomy 368, 372
Radio show: Longest running (U. S.) 701
Radio waves 368, 372; Discoverer 368
Radiotelemetry 74, 96, 191, 193, 196, 198; Transmitter, solar-powered **96**
Raft trips: Yukon River 571, 574, 575, 576
Railroads: Arkansas 399, 410; Chicago, Ill. 474; Hudson River rights-of-way 64, 66-67, 78, 83; Panama 280, 282, 293; Pennsylvania 737, 749, 752-753, 754, 765; Yukon 558
Rain forests: New Zealand 117, 121, 122, **122-123, 126**
Rainbow City, C. Z. 289
Ramblas, Barcelona 315, 316
Ranches: Mexico: Peasant invasion 612, **616-617,** 617; Pelly River, Yukon **566-567,** 571, 574
Rattlesnake roundup: Cross Fork, Pa. **749**
Raymer, Steve, photographer: ***Chicago!*** Apr., 463-493
Razorbacks (Arkansas football team) 413
Rebel Spirit (towboat) 217-218, 220
Reclamation: Israel 233, 238; Jordan **244-245;** Lebanon **868-869;** Pennsylvania **746-747**
Recording industry: Nashville, Tenn. 699, 706, 710
"Red-hot poker" (flower) **120**
Red Square, Moscow 16, 20, **22-23,** 40
Reed, Walter 293
Reefs: Coral: Core samples **519;** Man-made 203-204, 506
Reese, Frances 69-70
Reforma, Mexico 625-626; Oil fields 625, 627, natural-gas flares 625, 626, **641**
Refugees: Armenians 847, **850,** 851, 858, World War I 853, 869
Reid, Ogden 77
Reina, Armando 633
Religions: Mythology, Greek 150-151, 164, 167, 168, 181, 184; Spiritist: Brazil 274; *see also* Christianity; Lamaism
Reptiles: Gulf Coast 217, 218, 222; *see also* Crocodilians
Republicans: Spanish civil war 303, 327
Reynolds, Alison **845**
Rhinebeck, N. Y. 84, 85
Rhône (river), Switzerland–France 803
Rhytons, Minoan **152,** 160
Ribeiro, José Adailton 256
Ricalde, Humberto 661
Rice farming: Arkansas 396, 398, 399, **400-401,** 402, 403, 418-419; Brazil **272-273**
Ridzong Gompa (lamasery), Ladakh: Lamas **351,** 353
Rifles **601;** Kentucky rifle 760
Rings: Gold: Minoan 166-167, **178-179;** Turquoise **415**
Rio de Janeiro, Brazil: ***Brazil's Golden Beachhead.*** By Bart McDowell. Feb., 246-277
  Aerial view **247**
  Beaches 248, **249,** 269, 272, 273, 274
  Carnival 246, **246, 254-255,** 269, 272, 274, 276
  Housing 269, 273
  Mountains **247,** 248, 272
  Population 248; Growth 248
  Religion: Spiritism 274
  Restaurant **252-253**
  Sports 273; Soccer **250-251,** 273-274
  Tourism 257
Rio Grande (river), Mexico–U. S. 623
Rip Van Winkle Bridge, Hudson River **80**
Ripley, S. Dillon 823
Ritter, Johann **368**
Rivas, Valentin **291**
Rivers *see* Hudson River
Riverside Furniture, Fort Smith, Ark. 420
Rizzo, Frank Lazzaro 731, 736
Robertson, James 699
Robots: Martian rover 369, **386,**

389
Rock Island Railroad: Arkansas 399, 410
Rockefeller, Winthrop 415
Rodeo: Louisiana **205**
Rodrigues, Augusto 269
Rodrigues, José Honório 274
Rodríguez, Jesús 618, 620
Roentgen, Wilhelm Konrad 364, **368**
Rogers, Roy **707**
Rokeby (estate), N. Y. 84-85
Rolin, Nicolas, and wife 815
Rolling Rock steeplechase: Pittsburgh, Pa. 749; Rolls-Royce, picnic in trunk of **748-749**
Roman-Jewish War (A.D.66-73) 235, 236, 238, 239, 241
Romanée-Conti (vineyard), Burgundy, France 796, 814-815; Master of the Cellar and of the Vines **796,** 815
Romanoff Caviar 74
Romanov, Alexey 34
Ronning, Chester 440, 448
Rookeries: ***Hawaii's Far-flung Wildlife Paradise.*** By John L. Eliot. May, 670-691
Roosevelt, Franklin Delano: Hyde Park estate 83
Roosevelt, Theodore 141, 280-281, 289, 671; Caricature **279**
Rosa, Doña 651
Roseate spoonbills **218-219**
Royal Canadian Mounted Police: Yukon Territory 570, **575**
Royal Palace, Madrid **319,** 322
Royce, William 515
Royko, Mike **484,** 490, 492
Rubies: Russian jewels **25, 26, 30**
Rudolf, Lake, Kenya 111
Rudolph, Wilma **695**
Ruiz Hernández, Belisario 635
Rushing, Ark. 426
Russell, Ray 623
Russellville, Ark. 420
Russia: ***Imperial Russia's Glittering Legacy.*** Jan., 24-33
Russian immigrants: Brazil 256
Ryman Auditorium, Nashville, Tenn. 694, **701**

S

Sabine Pass Battleground State Historical Park, Texas 220
Safi, Jordan 245; Destruction of 243; Resettlement of **242-243**
Sagalen, Victor 451
Saghatelian, Janet and Sam 861
Sahagún, Bernardino de 669
Sailplanes: ***The Thousand-mile Glide.*** By Karl Striedieck. Mar., 431-438
Ballast 431, 434, 435, **438**
Cockpit **431,** 435, instruments 431, 432, **433,** 434
Jeep tow 432, **432-433**
St. Basil's Cathedral, Moscow **22,** 40
Saint Christophe en Brionnais, France: Cattle market 796, 799, café **804-805**
St. Gregory the Illuminator Cathedral, Soviet Armenia 873; Interior **867,** 873
St. Lucia, South Africa: Crocodiles **92-93, 100-103,** 108, 111
St. Madeleine, Abbey Church of, Vézelay, France 806, **813**
St. Patrick's Day: Chicago, Ill. **467,** 485
St. Philip Neri, Church of, Cádiz, Spain 305
St. Thomas Hospital, Nashville, Tenn. 703
Sakellarakis, John and Effie 150, 164, 166, 167
Saksa, Jim 473-474
Salome (daughter of Herodias) 243
Salt flats: Dead Sea region 233, 243, **244-245,** 245
Salt line: Hudson River 66, 81, diagram **66-67**
Saltwater crocodile: ***A Bad Time to Be a Crocodile.*** By Rick Gore. Jan., 90-115
Saltworks: Israel 228, **228-229**
Samba: Brazil **246,** 272, schools 246, **254-255,** 269, 274, 276
Sambhava, Padma 354, 358
San Joaquin Valley, Calif.: Armenians 861
San Lazzaro (enclave), Venice, Italy **859;** Seminary **858-859**
San Pablito, Mexico: Healer **656, 657;** Papermaking 657, 658, 661
San Sebastián, Spain 308; Gourmets 309, 312, **315**
San Vicente de la Sonsierra, Spain: Holy Week penitents 305
Sandburg, Carl: Quoted 469
Sandusky, Frank 766
Santa Barbara Channel, Calif.: Abalone culture **499-500**
Santa Clara del Cobre, Mexico: Metalwork **652**
Santacroce, Nunzio **726**
Santiago de Compostela, Spain 326
Santos, Brazil 256, 267
São Bernardo do Compo, Brazil: Auto industry 257
São Paulo, Brazil: ***Brazil's Golden Beachhead.*** By Bart McDowell. Feb., 246-277
Aerial view **276-277**
The arts **274, 275**
Commerce **271**
Geography 248, 256
Housing 254, 261, 269
Immigrants 256-257, **266-267**
Industry 257, 276
Infant mortality rate, rising 254
Mayor 248, 256, 257, 261
Pollution 254, 276
Population 248, 256, 261, 276; Ethnic diversity 256
Skyscrapers 248, 256, **276-277**
Subway system 257
Sarkisyan, Fadei T. 869
Saroyan, William **856,** 861-862, 863
Scenic Hudson Preservation Conference 70
Schaller's Pump, Chicago, Ill. 485, **489**
Schiering, Wolfgang 180
Schlemmer, Tillie Laysan **672, 673**
Schliemann, Heinrich 148, 151, 181; Drawing of **148**
Schoening, Bill 372
Schrader, Glendle 595, 602, 606
Schroeder, Ray and Dot 402
Schutz, Roger 810, **812**
Schuylkill (river), Pa. 736, **742-743**
Schweer, George 407
Scorpio II (fishing boat) 204, 208
Scripts, ancient 151, 174, **174,** 175, **175,** 181
Scrombrus (factory ship) **508, 509**
Sculpture: Chicago, Ill. 469, **474, 475;** Chinese tomb *see* Terra-cotta sculpture; Lebanon **872,** 873; Miniature **661, 863;** Minoan **150, 171,** 172; National Air and Space Museum **822**
Sea dragons: ***Dragons of the Deep.*** By Paul A. Zahl. June, 838-845
Sea horse, Australian **844,** 845
Seabee barge system 212-213
Seabirds: Gulls **200-201;** ***Hawaii's Far-flung Wildlife Paradise.*** By John L. Eliot. May, 670-691
Sealabs (underwater habitats) 204
Seals, monk 671, **682, 683,** 684
Sealstones: Minoan 151, 160, 172, impressions from **171, 174**
Sears, Kenny 709-711
Sears Tower, Chicago, Ill. **468,** 469, **476;** Shadow **460**
Sedom, Israel 228, **228-229**
Seeger, Pete 67-69, **69**
Segovia, Andrés **323**
Segovia, Spain 307
Seine (river), France 802, 803
Selikoff, Irving J. 81
Sens, France: Cathedral 806
Serçe Limanı, Turkey 770, **772;** Expedition: ***Glass Treasure From the Aegean.*** By George F. Bass. June, 768-793
Artifacts, ownership of 792
Excavation: Hazards 768, 770, 777, 786, 787; Method 777, 780, grid 777, **781-783**
Funding 768, 774
Location map 772
Mascot **777,** 786, 792
Team 774, 777
Seri Indians: Mexico: Face painting **665**
Serkowski, Krzysztof 729
Service, Robert 554, 578; Writings 554, 559, 578
Setrakian, Robert 861
Setubal, Olavo Egydio 248, 256, 257, 261
Seville, Spain: Holy Week 305
Sewage: Dumping, offshore: New York Bight **520;** Treatment plants: Hudson River **87,** world's largest: Illinois 479
Shachaf, Danny 233, 238
Shad: Hudson River 62, 63, **66, 67,** 77, spring run 73
Shafter, Calif.: *Gossamer Condor* flights 130, 139

Shang Dynasty (1700-1100 B.C.): Tombs, royal 448
Shapp, Milton J. 764-765
Sharks: Leeward Islands, Hawaii **676,** wildlife, menace to 676, **683**
Sharp, Mrs. Warner 704
Sheep: Dall ram **564;** Ritual use **864, 865,** 872; Spain 307, 321, 326
Sheffer, Dan 376-377
Shensi Province, China 448
Shepard, Alan B., Jr. 834
Sherry: Spain 306, winery **314**
Shey Gompa (lamasery), Ladakh: Interior **344-345**
Shilov, Leonid 15
Shipbuilding: Evolution of 780, 787, 790, Mycenaean 154; Minoan 157, 159
Shipping: Arkansas River 402, 407, 409; Pennsylvania ports 736, 743, 753; *see also* Gulf Intracoastal Waterway; Panama Canal
Shippingport Atomic Power Station, Pa. 746
Ships **505, 506, 520;** Factory ship **508;** Minoan **157-159;** Mycenaean galleys **154-156;** Sailing ships 203; Superships 290, 292, 293; Trawlers **508-509, 512, 513**
Shipwrecks 729; *Argo Merchant* **516-517;** Padre Island, Texas 220; *see also* "glass wreck"
Shlaes, Jared 483
Shlomo (Israeli) 225, 228
Shrimpers: Gulf Coast, U. S. **201,** 204, blessing of boats 204
Siamese crocodiles **95,** 97
Sian, China 448, 451, 452
Sierra del Caurel, Spain 326
Sierra Nevada, Spain 306-307
Siler, O. W. 518
Silva, Joscy Antonio 267
Silver: Mexican silverwork **653;** Mining: Yukon Territory 568
Silver Hill, Md.: Repair shop, National Air and Space Museum 822
Simpson, Lesley 617
Sincock, John 679
Singh, V. B. 100
Singing societies: Spain 307
Siteki, Swaziland: Wedding **48-49**
Six-day war (1967) 225, 241
Skin trade, crocodilian: ***A Bad Time to Be a Crocodile.*** By Rick Gore. Jan., 90-115
Auctions, annual 97, 108, 111-112
Caiman skins, trade in 95, 97
Contraband 97, **114**
Decimation of species due to 90, 91, 96, 97, 100, 111
Farming, commercial 100, 101, 112, **113,** 114
Hunters, skin **108,** 112
Hunts, managed 97, 108, 110, 111, 112
Inferior-quality skins 107, 111
Laws pertaining to 91, 96, 97, 111, 114
Leather firms 111
Luxury-item production 91, 111, 112, 114, **114**
Poaching; black market 97, 107, 111, 114
Prices brought: Finished goods 91, 111; Skins 112
Skins, preparation of **109,** 111, 112
South American trafficking 97
Skookum Jim (Indian) 558
Skull, papier-mâché **667**
Skylab 365, 368; National Air and Space Museum exhibit 822, **836**
Skyscraper, world's tallest 460, **468,** 469, **476**
Slavery: Brazil 251, 256
Sloop, Hudson River cargo: Replica 67, **68**
Smith, Jim 571
Smithsonian Institution: Tropical research: Canal Zone 282, 288, 292; *see also* National Air and Space Museum
Smolan, Rick, photographer: ***Alone Across the Outback.*** May, 581-611
Smuggling: Crocodilian products 97, **114**
Snake goddess, Minoan 146, **150,** 160, 184
Snow, Hank **693**
Soaring: ***The Thousand-mile Glide.*** By Karl Striedieck. Mar., 431-438
Altitude gain 431, 433, 434, 435, 436
Distance record 431, 434, 438; Certification **434,** 435-436, **438;** Map 434-435; Previous attempt 431, 434, 435-436
Mountain wave 434, 435, 436
Ridge lift 434, 435, 436
Ridge running 432, 433, 434
Sailplane **428-432, 437, 438;** Ballast 431, 434, 435, **438;** Cockpit **431,** 435, instruments 431, 432, **433,** 434; Jeep tow 432, **432-433**
Thermals 431, 433, 434, 435, 436-437
Turbulence effects 432, 433
Sobhuza II, King (Swaziland) 47, 48, **50**
Soccer: Brazil 250, 273-274
Socialist Workers Party (PSOE): Spain 324, 330
Société des Vignerons: Benmarl vineyard, N. Y. 86, 88
Sodom and Gomorrah: Site of 228, 245, map 231
Sofía, Queen (Spain) **328**
Softball, 16-inch **484,** 492
Soil desalination 233, 245
Solar power: Bacteria photosynthesis 230, 233; Solar-powered transmitter **96**
Soldiers, terra-cotta: Chinese tomb 440, **441-447,** 448, 449, **449,** 450, **458, 459,** cover ill., diagram **450-451**
Solti, Sir Georg 469
Soteno, Pedro **662**
Soutar, Andrew **523**
South (region), U. S. *see* Arkansas; Gulf Intracoastal Waterway; Nashville, Tenn.
South Africa: Crocodiles **92-93, 100-103,** 108, 111; *see also* KwaZulu
South America: Caimans 94, **94,** 97; *see also* Brazil; Four-eyed fish
South Dakota: Bald eagles 196, 198
South Island, New Zealand *see* Milford Track
Soviet Writers' Union: Club **8,** 24
Soviets (councils): Elections **18, 19,** 44
Soybean farming: Arkansas 398, 402, 403, 420, farmers 396, **398;** Brazil 257, 263, 267, **272-273**
Soyuz (spacecraft): Replica **834-835**
Spacecraft *see* National Air and Space Museum
Spad VII (biplane) **826-827**
Spain: It's a Changed Country. By Peter T. White. Mar., 297-331
African enclaves 303, 306
Armed forces 300, 331
Capital *see* Madrid
Central plateau (Meseta) 300, 320, 327
Civil war (1936-1939) 297, 303, 306; Combatants 303; Guernica, bombing of 312; Toledo, siege of 327
Constitutions 306, 330
Economy 297, 303; Boom 301, **304, 305,** 306, 307, 316, 320, 326; Growth rate 317, 320; Inflation 317
Elections 297, 324, 330
Exports 301, 316
Facts and figures 303
Farms and farming: Crops 300, 303, 309, 321, 322; Irrigation 300, 305, 309, 321, 322
Flag **303**
Foods, regional 300, 307, 312, **315,** 317, 322
History 300, 327; Central government, rise of 307; Cortes of Cádiz 306; Empire 306, 330; Franco regime 297, 303, 306, 324, 325; Moors, defeat of 299, 305, 307; *see also* Civil war, *above*
Industry 301, 303, 315, 316, **316,** 317, 320, 322, 323; Shipbuilding 303, 320
Labor force: Emigrant laborers 320, 326; Farm workers, exodus of 309, 321, 322; Strikes and lockouts 317; Unemployment 303
Map 302-303
Police, national 312, 315, 317
Political parties 297, 305, 322; Rallies 305, **324-325,** 330
Population 297, 303
Prime minister *see* Suárez, Adolfo
Religion 303; Holy Week **296,** 297, 300, 301, 305

Royal family 319, 322, 328, **328, 329,** 330
Separatist movements 297, 303, 307, 312, 315, 316, 326
Tourists 297, 301, **305,** 306, 315
Spalzangs, Thuphstan 353
Spanish Sahara: Cession of 303, 306
Spanish treasure: Padre Island, Texas 220
Spanish Village, Barcelona 315
Spears: Chinese tomb **442-447,** 450; Javelin throwing **624;** Zulu-Swazi wedding **46, 51**
Special Gold Medal, NGS: Recipient 141
Specialized Youth School for Gymnastics No. 1, Moscow 15-16
Spectroscopy: Astronomy 372
Spectrum, electromagnetic 364; Uses **368-369**
Spewock, Ted 740, **753**
Spiegel, Ted, photographer: ***The Hudson: "That River's Alive."*** Jan., 62-89
Spinning: Ladakh **340**
"spirit city," Mount Li, China 451; Diagram **450**
Spirit of St. Louis (airplane) 819, **819**
Spirits: Brazil 274; Ladakh *see* Lamaism
Spoonbills, roseate **218-219**
Sports *see* individual sports
Springdale, Ark.: Chicken industry 423, egg candling **417**
Squatters: Canal Zone jungle 294; Philadelphia, Pa. **740**
Ssu-ma Ch'ien 442, 459; Quoted 442, 448, 452
Standard Oil Building, Chicago, Ill. **468,** 469
Staphylos (historian) 184
Station Square, Pittsburgh, Pa.: Restoration **758**
Steadman, David and Margot 608, 610
Steel industry: Chicago, Ill. 473-474; Lázaro Cárdenas, Mexico 618, 620; *see also* Pennsylvania
Stereograms 376; Electron micrographs 380; Human body **363, 365,** 376-377
Sterling, George 738
Stevenson, Robert E. 367
Stewart Island, Yukon 574-575
Stockyards: Chicago, Ill.: Closing (1971) 469, 470, gate 469, **471**
Stoeckenius, Walther 230
Stoltzfus, Melvin 754, 756, 757
Stork (man-powered aircraft) **135**
Storm King (mountain), N. Y.: Pumped-storage power plant, proposed 69-70
Strasburg Railroad: Pennsylvania Dutch country 754
Street, Milton **740**
Striedieck, Karl: ***The Thousand-mile Glide.*** Mar., 431-438
Striedieck, Suzanne **431,** 432
Strip mining: Pennsylvania 738, inspection of **747**
Stromatolites: Australia **608**
Stroudsburg, Pa. 760
Sturgeon: Hudson River **66, 67, 71,** 74, 77, 19th century **70,** 74, study 74, 76
Stutter, Mike 578
Stuttgart, Ark. 399, 402, **418-419**
Suárez, Adolfo 322, 324, **329,** 330
Submarines: Continental-shelf research, used in 527, 530-531, **530-531**
Subways: Moscow 9, **43;** São Paulo, Brazil 257
Sudd (swamp), Sudan: Drainage of, affecting crocodiles 111
Sugar Loaf, Rio de Janeiro **247,** 272
Sugarcane: Louisiana 209
Sullivan, Louis 483; Ironwork by **481**
Sulphur, La.: Crocodile-skin workers **109;** Rodeo **205**
Sumdah, Ladakh 342; Lamasery 342; Villagers 342, **349, 352**
Sunnyside (estate), Tarrytown, N. Y. 64, 66, **79**
Superdome, New Orleans, La. **214**
Supreme Soviet, U.S.S.R. 40; Meeting place **5,** 40; Presidium, President of the **17,** 40, past President 40
Surinam: Four-eyed fish **394-395**
Suru River, Ladakh **346-347**
Surveyor (spacecraft): Engine **836**
Susquehanna (river), Pa.–Md. 733; West Branch **732-733**
Sutherland, Donald 124
Sutherland Falls, New Zealand 118, 124, 127
Suwaymah (spa), Jordan **224,** 241
Sverdlov region, Moscow 44
Swaziland: ***Zulu King Weds a Swazi Princess.*** By Volkmar Wentzel. Jan., 47-61
Sweeney, Willard S. 294
Swords: Chinese tomb 442, 450; Shipwreck relic **790;** Zulu-Swazi wedding **46, 56,** 57
Sydney Island, Texas: Birds **218-219**

T

Tabasco (state), Mexico: Oil fields 620, 625
Tabasco pepper sauce factory **211**
Tagashov, Viktor 9
Tagish Charley (Indian) 558
Taizé, France: Ecumenical community 810, 812
Tajo (river), Spain 305, **326-327**
Talaat Pasha 862
Talatininan, Father **870**
T'ang Dynasty (A.D. 618-907): Horse sculpture 449; Pottery: Islamic imitation 792
Tankers, oil 292; *Argo Merchant* wreck **516-517;** Supertankers 293
Tappan Zee, Hudson River 66, 67, 78; Aquatic life, diagram **67;** Bridge **62-63**
Taras Shevchenko (trawler) **513**
Tarascan Indians: ***Mexican Folk Art.*** By Fernando Horcasitas. May, 648-669
Tarazona de la Mancha, Spain 300
Tarrytown, N. Y.: Estates 64, 66, **78, 79**
Tatars (tribe) 16, 27
Tatick, Steve 74
Te Anau, Lake, New Zealand 117, 127
Tea: *solja* (Ladakh) 335, 340, 353
Tebtynis, Egypt: Crocodile graves 102
Technology: Middle Ages: Shipbuilding 780, 787, 790; Stone-utilization research 867; ***The Wondrous Eyes of Science.*** By Rick Gore. Mar., 360-389; *see also* National Air and Space Museum; Oil
Tecumseh (ironclad) 208
Tehuantepec, Mexico 652, 658
Television: Minicamera **382,** CCD's 383, 389; Shows 692, 699, taping of **700-701**
Tempe Downs, Australia 586, 589
Tennessee *see* Nashville
Tennessee–Tombigbee Waterway, U. S. 208
Teodoro, Don 650
Tequila (liquor) 632-633
Teresa of Avila, Saint: Relic 322
Terkel, Studs **463,** 469
Termites: Dwellers in the Dark. By Glenn D. Prestwich. Apr., 532-547
Alates 532, 533, 534, **536,** 537, 541; Mating ritual 534, 535, **537;** Nuptial flight 533, 534, **536,** 541; Predation of 534-535, 537, 541, cannibalism **537;** Swarm season 533-534, 537; Wing shedding 534, 537, 540
Benefactor in soil ecology (Africa) 538, 540
Communication, chemical 532, 534, 537, 538, 543
Destructive species 539-540
Diet 532, **538-539,** 539, 540, 541, **547;** Food gathering **538-539,** 545, 546; Fungus gardens 539, 541, 542, **547;** Waste-nothing eating 541, 546
Digestive system 539
Eggs 537, 545, **546, 547**
Enemies, insect 534, 540, **541**
Evolutionary link 538-539
Habitats 538, 539 *see also* Mounds, *below*
King 535, **537,** 541, 545, **545**
Larvae **533-535,** 545, 546, **546**
Life span 546; Queen and king 545, 546
Light, reaction to 543, 546
Mounds 534, 535, **535,** 540, 545, 546; Climate-controlled 540-541, 542; Height 534, 542; Layout 540-541, cross section **542;** Nurseries **534-535,** 545, 546; Repairing of **534-535,** 542, 545; Royal chamber 535,

542-543
Queen **532-533,** 535, **537,** 541, **543-546,** 545; Feeding and grooming of 537, 543, **544,** 545; Fertility, years of 543, 545, egg-laying rate 545, 546; Giantism 543, 545
Senses 546; Blind 532, 546
Social structure 532, 541, 542, 543, 545
Soldiers 532, 533, 535, 537, **537, 540, 541,** 545, 546
Species 539-540; Number of 539
"white ants" a misnomer 538
Workers 532, 533, **534-535,** 535, 537, **537-539, 542-547,** 545, 546
Tern Island, Hawaiian Islands **680-681;** Fairy-tern "nesting" **687**
Terra-cotta sculpture: ***China's Incredible Find.*** By Audrey Topping. Apr., 440-459
Territorial waters 503; Law of the sea conferences 503, 507, 523; 12-mile limit 503, 506; 200-mile zone 503, 506-507, 509, 513, 514-515, 518, 523, 524
Terrorists 851
Texas: Gulf Coast 200, **200-201,** 202, 203, 204, 206, 213, **216,** 220, **221,** 222, **223**
Texas A & M University: Serçe Limanı expedition 774
Texas City, Texas: Petrochemical complex: Stacks **223**
Texas Institute for Rehabilitation and Research, Houston: Biostereometric research 364-365, 376-377
Thailand: Crocodile-breeding farm **95,** 97
Thera (island), Greece: Aerial view **162;** Atlantis-legend theory 180; Volcanic eruption 147, 163, 179-180; *see also* Akrotiri
There's More to Nashville than Music. By Michael Kernan. May, 692-711
Thermograms **368, 369**
Thomas Nelson, Inc. **706**
Thompson, "Big Jim," and wife **466**
Thomson, David and Jan 610, 611
The Thousand-mile Glide. By Karl Striedieck. Mar., 431-438
Thrones: Europe's oldest 160, **170;** 16th-century Russian ivory **28**
Tibetan Buddhism: ***Ladakh: The Last Shangri-la.*** By Thomas J. Abercrombie. Mar., 332-359
Tien Shan (mountain range), U.S.S.R.–China: Tulip species 724
Tigran the Great, King (ancient Armenia) 852
Tikse, Ladakh 338; Lamasery **343**
Tin: Continental shelf 507; Trade routes, ancient 803
Tioga County, Pa. **755**
Tiridates III, King (ancient Armenia) **849**
Titusville, Pa.: First commercial oil well 734, 740, 742
Tlapanec (language): Mexico 638
To Fly (movie) 823, **830-831**
Toivonen, Erik **191,** 193
Toledo, Spain **326-327**
Tolosa, Spain 315
Tombs: Archangel Cathedral, Moscow **5;** ***China's Incredible Find.*** By Audrey Topping. Apr., 440-459; Dijon, France 803; Granada, Spain 307; Minoan 150, 164, 166, 175
Tontitown, Ark.: Chicken farm 423
Tools: Handcrafted **352,** wooden 342; Sickle, antique **172**
Toombs, Lowry 549
Tooth healing **381**
Toothpick carving **661**
Topping, Audrey: ***China's Incredible Find.*** Apr., 440-459
Tornadoes: Studies of 376
Torrejón de Ardoz, Spain: U. S. Air Force base 320
Torres, Angelita **665**
Torrijos Herrera, Omar 288, **289**
Totems: Saltwater crocodile 96, **97**
Toucan (man-powered aircraft) **135**
Towboats: ***The Gulf's Workaday Waterway.*** By Gordon Young. Feb., 200-223
Towne, Hap 694
Townsend, Lloyd K., artist: ***Minoans and Mycenaeans: Greece's Brilliant Bronze Age.*** Feb., 142-185
Toxic Substances Control Act (1977) 81
Toxopeus, Sies Jan **714**
Trade routes: Celts 803; Himalayas (pre-1949) 335, 337, 342, 346-347, map 335; Minoan and Mycenaean: Map 154
Trail of '98 (Klondike gold rush) 553; Historical park 572
Transcontinental railroad, first: Isthmus of Panama 280, 282, 293
Trapiche, Mexico: Cooperative 631
Trapping: Yukon Territory **556,** 560, 564, 565, 575
Tray, lacquerware: Detail **668**
Treasures, sunken: Padre Island, Texas 220; ***Treasure From the Aegean.*** By George F. Bass. June, 768-793
Treasures of the Tsars. Jan., 24-33
Treaties: World War I 862; *see also* Canal Zone
Tree of Life (ceramic decoration) **662-663**
Tretyakov Gallery, Moscow **6, 11**
Treushnikov, Anatoly V. 44
Troika: Moscow **15**
Trojan War 149, 151, 183, 184; Historicity, possible 181
Troparevo (satellite community), Moscow 9
Troy (ancient city), Asia Minor 148, 149, 151, 181
Troy, N. Y.: Hudson River tides 64, 66
Trucks, 120-ton **562-563,** 570
Truman, Harry S. 495, 503, 507
Tu Pao-jen 448, 450
Tulips: Holland's Beautiful Business. By Elizabeth A. Moize. May, 712-728
Anatomy: Diagram **718**
Auction **722**
Blossoms: Cutting of 716, 728; Refuse **716, 717**
"breaking" 714, **714**
Bulbs 716, **718,** 719, **726,** 727, **727,** 728; Measurement of **727**
Cultivars 714, **714, 715,** 719, **719, 724-725;** Number of 714
Export 712, 727; Warehouse **726**
Fields **716, 720-721**
Flowering season 728
Forcing of blooms 723, **723**
Gas exuded 727; Measurement **727**
Growing instructions 728
History 712, 714
Hybridization 714, 719, 724, 725; Hybrids **714, 715**
Industry 712; Disputes, settlement of 727
Mutants 719, **719,** 725, **725**
Origin 712, 724
Production 712
Reproduction 714, 719; Artificial pollination **719;** Reproductive parts, diagram of **718**
Seedlings **719**
Species, wild 724, **724,** 728; Number of 724
Speculation in 714
Spraying of **716**
Tumor detection 377
Tumulus *see* Mount Li, China
Tuna, bluefin **528-529**
Turguttekin, Mehmet 770
Turkana, Lake, Kenya: Crocodiles **106, 107,** 111
Turkey: Tulips 712, 714; *see also* Armenians; Serçe Limanı
Turnbull, Betty 117
Turnbull, Phil 117, 121, 127
Turquoise: Ladakhi ornaments **334,** 358, cover ill.; Rings **415**
Turtles: Atlantic ridley 222; Green 671, **676-677, 684-685**
Tyson Foods, Inc., Springdale, Ark. 423; Egg candling **417**
Tzeltal Indians: Mexico 620-621

U

U-2 incident 834
Udouj, Herman 420
Ulster Landing Park, near Kingston, N. Y. **82-83**
Ultraviolet: Discoverer **368;** Uses 364, **368-369,** 372, **380,** 381, 389
Uncle Sam's Museum with Wings (National Air and Space Museum). By Michael Collins. June, 819-823; Photographic portfolio. Text by Michael E. Long. June, 825-837
Union of Soviet Socialist Repub-

lics 1; Fishing industry 518, 523, 524, fleet **513,** 518; *see also* Armenians; Moscow
United Keno Hill Mines, Yukon 568
United Methodist Publishing House, Nashville, Tenn. 704
United Nations: Law of the sea conferences 503, 507; Wildlife conservation projects 98
United States: Brazil, relations with 251, 261; Crocodilian commerce restricted 91, 111, 114; ***Glittering Cities, Lonely Wild Lands*** (New York, New Jersey, Pennsylvania). Jan. supplement; Mexico, trade with 628; Nuclear power plant, first commercial 743; Oil well, first commercial 734, 740, 742; Panama, relations with 279, 280, 283, 288; Termite destruction 539-540; *see also* Arkansas; Armenians; Chicago, Ill.; Continental shelf; Gulf Intracoastal Waterway; Hawaiian Islands Wildlife Refuge; Hudson River; Minnesota; Nashville, Tenn.; National Air and Space Museum; Pennsylvania
U. S. Air Force: Spain 320
U. S. Army: Canal Zone 287, 288, 289-290, **292-293**
U. S. Army Corps of Engineers 81, 209, 219, 222, 402; New York Harbor cleanup **72**
U. S. Border Patrol: Mexican aliens 623, **635**
U. S. Coast Guard: Helicopter **520;** Hudson River: Oil spill cleanup 85, shipping lane 67; Leeward Islands, Hawaii 671, 680-681, 686, 691; Policing fishery zone 518
U. S. Department of Agriculture: Inspection of tulip bulbs 727
U. S. Department of the Interior: Oil leases, offshore 507
U. S. Fish and Wildlife Service: Bald-eagle breeding 199; Crocodilian-products seizure **114;** Hawaiian Islands wildlife refuge 671, 684
U. S. Geological Survey: Core sampling **519**
U. S. Navy: Blue Angels 208, **830-831;** Florida facilities 204, 208; Panama Canal 292, 293
United Steelworkers of America 737
University of Pennsylvania School of Veterinary Medicine, Kennett Square, Pa. 760, **761**
University of Sydney, Australia: Crocodile research 92, 96, **96**
Uptown (neighborhood), Chicago, Ill. **478-479**
Uranium atoms: Behavior 380
Urban renewal: Philadelphia, Pa. 736, **741;** Pittsburgh, Pa. 758
Uttar Pradesh (state), India: Gharial breeding centers 100-101

V

Valencia (region), Spain 316-317; Language 303, 316
Valladolid, Spain: Holy Week procession **296;** Museum 300; Religious brotherhoods **296,** 300
Valle, Pedro 635
Valley Forge, Pa.: American Revolution 735, 754
Valois, house of: Dukes of Burgundy 798, 803
Vanderbilt, Frederick: Estate **78-79**
Vanderbilt University, Nashville, Tenn. 703, 708
Van Tassell, Dutch 568
Van Trump, Jamie 737, **758**
Vazken I (Catholicos) **866,** 872, 873
Venice, Italy: Armenian seminary **858-859**
Ventris, Michael 174, 181
Venustiano Carranza, Mexico: Weavers **654-655**
Vercingetorix (Gallic leader) 798
Vernier engine **836**
Verplanck, N. Y. 70, 74
Veterinary hospital: Animal-handling equipment 760, **761**
Vézelay, France: Abbey church 806, **813**
Viesca, Mexico: Desert near **638-639**
Viking Boat Yard, Verplanck, N. Y.: Sturgeon catch **71**
Viking missions: Photos by 360, **387**
Viking spacecraft: Remote-control capabilities 823
Villa, Pancho 579
Villahermosa, Mexico 625; Cattle near **626-627;** Market 626-627; Oil fields near 625, 627, 641
Villanueva de la Jara, Spain 300
Villard, Paul **368**
Villena, Spain 301
Vincenot, Henri 816
Vincent, J. Ross 217
Vineyards: ***Living the Good Life in Burgundy.*** By William Davenport. June, 794-817; New York 86, 88; Spain 306, 309, **316-317;** Yettem, California 861
Virgin of Talpa: Souvenir **658**
Visible light: Uses of **368-369**
Volcanic islands: Hawaiian Islands 674; Thera, Greece 147, 163, 178-180
Volcano: Mexico **614-615**
Volkswagen: Brazil 257; Mexico **613;** Pennsylvania 746
Vorozheykin, Ivan 44
Voznesensky, Andrei **8,** 24, 44
Vultures, griffon: Spain 322

W

Wakulla Springs, Fla.: Alligator **115**
"Walk of a Lifetime." By Carolyn Bennet Patterson. Jan., 117-129
Walker, Dr. and Mrs. C. J. 707, 709
Wallace, James **285,** 287, 294
Wallace, Sue 288
Waltz, Fred **370**
Wangyal, Sonam 342, **352**
War of 1812: Pennsylvania 754
Ward, Henry, and family 606
Warnock, John 198
Warnsby, Benny 578
Warren, Peter 169, 172
Warren, Ark.: Beauty contest, children's **424-425;** Logs **417**
Warriors: Mycenaeans 154, 181, 182, armor **182;** Swazi **54-55;** Warrior figures *see* Terra-cotta sculpture
Washington, George 735, 754
Washington, D. C. *see* National Air and Space Museum
Water cannon (monitor): Gold mining **572,** 578
Water diversion: Wildlife habitats 91, 100, 111; *see also* Canals
Water hyacinths: Mexico **626-627**
Water jars: Black ware **651;** "glass wreck" **791;** Pottery stands for **659**
Water pollution: ***The Continental Shelf: Man's New Frontier.*** By Luis Marden. Apr., 495-531; Control: ***The Hudson: "That River's Alive."*** By Alice J. Hall. Jan., 62-89
Water Tower, Chicago, Ill. 469, **473**
Water wells: Australian desert 594, 605, 606, 607, 608
Waterfalls: Dead Sea region 241, 243, **244-245;** New Zealand **116,** 117, 118, 121, 123, 124, **125,** 127
Waterways *see* Gulf Intracoastal Waterway; Panama Canal
Watson Lake (town), Yukon 570
Watts, Bruce 112
Wax worker: Mexico 652, 654
Weaving: Mexico **654-655,** 661
Weddings: ***Zulu King Weds a Swazi Princess.*** By Volkmar Wentzel. Jan., 47-61
Wei River, China 451, **454-455**
Weigert, Lotario 266
Weights, glass balance-scale **788,** 790, 792
Welfare: Chicago, Ill. 487, 490; New York, N. Y. 487, 490
Wells, Charlie 704
Wentzel, Volkmar: ***Zulu King Weds a Swazi Princess.*** Jan., 47-61
West, Benjamin: Painting by **751**
West African crocodile 91, **94**
West Bank (Israeli-occupied Jordan): ***The Living Dead Sea.*** By Harvey Arden. Feb., 225-245
Western Europe: Labor force 320, 727
Westinghouse: Brazilian nuclear plant equipped by 251
Wetlands: Gulf Coast: Concern for 217, 219, 222
Wetmore, Alexander 672

Whale-Skate Island, Hawaiian Islands **675**
Where Bald Eagles Soar. By Thomas C. Dunstan. Feb., 186-199
White, Charlie **71,** 74
White, Peter T.: ***Spain: It's a Changed Country.*** Mar., 297-331
White, Suzanne **123,** 124
White Channel (riverbed), Yukon: Gold mining **572**
White Pass and Yukon (railway) 558
White-water sports: Hudson River **65;** Pine Creek, Pa. 748-749, 762-763
Whitehorse, Yukon 550, 558, 559, 568; Frantic Follies **548-549;** Newspaper, production of **568, 569;** Population 559; Restaurants 559, **559**
Whittaker, Richard 518
Whooping cranes: Texas 220, 222
Wildlife: ***Hawaii's Far-flung Wildlife Paradise.*** By John L. Eliot. May, 670-691; *see also* Bald eagle; Crocodilians; Four-eyed fish; Sea dragons
Wildlife management: Alligators 97, 108, 111, 112
Wildlife refuges: Aransas, Texas 220, 222; Crocodilians 92, 101, 102, 103, 108, 114; Eagle roost 198; ***Hawaii's Far-flung Wildlife Paradise.*** By John L. Eliot. May, 670-691; Spain 322
William Penn's Faire Land. By Gordon Young. June, 731-767
Williams, Amanda and Meghan **397**
Williams, Don 389
Williams, Edward Thomas 454
Williams, Martyn 559
Wilmot, Ark.: Clinic **412**
Wilson, Gabriel 377
Wilson, Joe 407, 408
Wilson, Woodrow 141
Wiluna, Australia 605, 606, 608
Windmills: Crete **173,** 184
Wine: California 861; New York 86, 88; Spain 300, 303, 315, 322, taster **314;** *see also* Burgundy
Witsell, Charles and Becky **406**
Wolinsky, Cary, photographer: ***Pennsylvania: Faire Land of William Penn.*** June, 731-767
The Wondrous Eyes of Science. By Rick Gore. Mar., 360-389
Wong, Luis **289**
Wood, Junius B. 1
Woodcarvings: Mexico: Mask **660,** toothpick figure **661,** toys 669
Woodcut printing: Buddhist manuscripts **345,** 353
Wool spinning: Ladakh **340**
Woolrich, Luis **652**
World Bank: Development loans: Mexico 635
World Trade Center, New York, N. Y. **89,** 469
World War I: Aircraft **826-827;** Flying paraphernalia **829;** Turkey 849, 852, 853, 862
World War II: Aircraft 222, **832-833;** German submarines: U. S. waters 204, 506; Liberty ship **506;** Moscow memorial 16
World's Columbian Exposition (1893), Chicago, Ill. 483
Wright, Frank Lloyd 483; Home designed by **480**
Wright, Orville and Wilbur 823; First manned flight (1903) 825; Flyer (1903) 819, **819, 824-825,** history 825; Glider (1902) **134**
Wright, Richard 484
Wrigley Field, Chicago, Ill. **485**

X

X-15 (aircraft) **819**
X rays **360, 368;** Astronomy 368, **369;** Cross-sectional **372,** 377; Discoverer 364, **368**

Y

Yaks: Ladakh 332, 338, **346-347,** by-products 335, 338, 340, 353, 358, yak-cow hybrid 338
Yang Hsien-min, artist: ***China's Incredible Find.*** Apr., 440-459
Yaroslav, Prince (Russia): Helmet **30**
Yassı Ada (island), Turkey: Shipwrecks, ancient 772, 787
Yellow fever: Panama Canal victims 280, 290, 292-293
Yellow River valley, China *see* Mount Li
Yerbury, Michael **96**
Yerevan, Soviet Armenia: ***The Proud Armenians.*** By Robert Paul Jordan. June, 846-873
Yettem, Calif.: Winery 861
Yoke, Bob 704
Yonkers, N. Y. 88
York, Pa. 754
Young, Gordon: ***The Gulf's Workaday Waterway.*** Feb., 200-223; ***Pennsylvania: Faire Land of William Penn.*** June, 731-767
Young Communist League: Newspaper **19**
Yukon News: Editor **568, 569**
Yukon River, Alaska–Canada 553, 558, 571, **573,** 574, 575; Headwaters 553; Indian name 571; Tributaries 549, **573**
Yukon Territory, Canada:
- ***Beauty to Flaunt and Bounty to Grow on.*** Apr. supplement
- ***Yukon Fever: Call of the North.*** By Robert Booth. Apr., 548-578
- Alcohol abuse 570
- Area 550
- Capital *see* Whitehorse
- Economy 550, 561, 568, 569, 574, 578; Exports 560-561, 569; Proposed pipeline 550, 559
- Establishment of 550
- Farming **566-567,** 571, 574
- Glaciers 567
- Gold rush (1898) 549, 550, 552, 553, 558, 559, 570, 571, 572, 574, 576, 578
- Highways **551,** 559, 570, 571
- Hydroelectric potential 555, 571
- Indians **556, 557,** 558, 559-561, 564-565, 570; Government support 560; Land-claims negotiations 556, 567-568; Population, percent of 556, 567
- Land management 574
- Maps 550, supplement
- Mines and mining 550, **560-561,** 562, 568-570, **572,** 576, 578; Ore reserves 568; Tailings **573,** 576
- Mountains **551, 564-565,** 567, **576-577**
- Parks; wilderness 550, 559, **564-565,** 567-568, **576-577**
- Pipeline, natural-gas 550, 559; Controversy 559; Map 550
- Population 550, 552
- Tourism 550, 558, 574, 578; Information *see* supplement
- Trapping **556,** 560, 564, 565, 575
- Wildlife **556,** 560, 564, **564,** 565, 567, 570, 571, 574

Z

Zahl, Paul A.: ***Dragons of the Deep.*** June, 838-845; Photographer: ***The Four-eyed Fish Sees All.*** Mar., 390-395
Zakros ruins, Crete 150, 172, 175; Artifacts from **152,** 175
Zales, Bob and Clara 204, 212
Zamora Province, Spain: Farmer and donkey **308-309**
Zangpo, Rinchen 342
Zapata, Emiliano 619, 661
Zapotec Indians: Mexico: Pottery **651, 658**
Zarqa Main (hot waterfall), Jordan 241, 243, **244-245**
Zaskar Range, Ladakh **346-347**
Zealots (Jewish sect): Mass suicide (A.D. 73) 235, 236, 238
Zellem, Ted 766
Zeus (god) 142, 164, 181, 184
Zhuravlev, Igor 16
Zihuatanejo, Mexico 635, 644
ZIL limousines: Moscow **17,** 20
Zim California (containership) **284**
Zinc and lead mine: Near Faro, Yukon **560-561,** 569-570
Zulu King Weds a Swazi Princess. By Volkmar Wentzel. Jan., 47-61
Zwelithini, Goodwill, King of the Zulus: ***Zulu King Weds a Swazi Princess.*** By Volkmar Wentzel. Jan., 47-61
Zworykin, Vladimir **369**

INDEXING STAFF

JOLENE M. BLOZIS *Chief*
MARTHA K. HIGHTOWER *Assistant Chief*
GEORGE I. BURNESTON
BARBARA L. KLEIN
ANNE K. McCAIN
BRIT A. PETERSON
JESSICA C. TAYLOR

Volume 154 July-December 1978

NATIONAL GEOGRAPHIC

INDEX

July-December 1978

VOLUME 154

PUBLISHED BY THE
NATIONAL GEOGRAPHIC SOCIETY
WASHINGTON, D. C.

NATIONAL GEOGRAPHIC SOCIETY

WASHINGTON, D. C.

Organized "for the increase and diffusion of geographic knowledge"

GILBERT HOVEY GROSVENOR
Editor, 1899-1954; President, 1920-1954
Chairman of the Board, 1954-1966

THE NATIONAL GEOGRAPHIC SOCIETY is chartered in Washington, D. C., in accordance with the laws of the United States, as a nonprofit scientific and educational organization. Since 1890 the Society has supported 1,606 explorations and research projects, adding immeasurably to man's knowledge of earth, sea, and sky. It diffuses this knowledge through its monthly journal, NATIONAL GEOGRAPHIC; its books, globes, atlases, filmstrips, and educational films; *National Geographic WORLD*, a magazine for children age 8 and older; information services; technical reports; exhibits in Explorers Hall; and television.

ROBERT E. DOYLE, President
GILBERT M. GROSVENOR, Vice President
OWEN R. ANDERSON, Vice President and Secretary
HILLEARY F. HOSKINSON, Vice President and Treasurer
WILLIAM T. BELL, FRANK S. DELK,
LEONARD J. GRANT, RAYMOND T. McELLIGOTT, JR.,
C. VERNON SANDERS, EDWIN W. SNIDER
Associate Secretaries

BOARD OF TRUSTEES

MELVIN M. PAYNE, Chairman of the Board
LLOYD H. ELLIOTT, Vice Chairman
President, George Washington University
MELVILLE BELL GROSVENOR, Chairman Emeritus
THOMAS W. McKNEW, Advisory Chairman

THOMAS E. BOLGER
Executive Vice President, American Telephone & Telegraph Company
FRANK BORMAN, Chairman of the Board and President, Eastern Airlines
J. CARTER BROWN, Director, National Gallery of Art
WARREN E. BURGER
Chief Justice of the United States
ROBERT E. DOYLE, President, National Geographic Society
GEORGE M. ELSEY, President, American National Red Cross
GILBERT M. GROSVENOR
Editor, National Geographic
ARTHUR B. HANSON, General Counsel, National Geographic Society
CARYL P. HASKINS, Former President, Carnegie Institution of Washington
JEROME H. HOLLAND
Former U. S. Ambassador to Sweden
CARLISLE H. HUMELSINE
Chairman of the Board, The Colonial Williamsburg Foundation
MRS. LYNDON B. JOHNSON
CURTIS E. LeMAY, Former Chief of Staff, U. S. Air Force
WM. McCHESNEY MARTIN, JR.
Former Chairman, Board of Governors, Federal Reserve System
LAURANCE S. ROCKEFELLER
President, Rockefeller Brothers Fund
ROBERT C. SEAMANS, JR.
Dean of the School of Engineering, Massachusetts Institute of Technology
FREDERICK G. VOSBURGH
Former Editor, National Geographic
JAMES H. WAKELIN, JR., Former Assistant Secretary of Commerce for Science and Technology
JAMES E. WEBB, Former Administrator, National Aeronautics and Space Administration
CONRAD L. WIRTH, Former Director, National Park Service

Trustees Emeritus

CRAWFORD H. GREENEWALT
JUAN T. TRIPPE
ALEXANDER WETMORE
LOUIS B. WRIGHT

COMMITTEE FOR RESEARCH AND EXPLORATION

MELVIN M. PAYNE, Chairman
EDWIN W. SNIDER, Secretary
ALEXANDER WETMORE, Chairman Emeritus

BARRY C. BISHOP, National Geographic Staff, ROBERT E. DOYLE, GILBERT M. GROSVENOR, MELVILLE BELL GROSVENOR, CARYL P. HASKINS, STERLING B. HENDRICKS, Scientist Emeritus, U. S. Department of Agriculture, THOMAS W. McKNEW, BETTY J. MEGGERS, Research Associate-Anthropology, Smithsonian Institution, T. DALE STEWART, Physical Anthropologist Emeritus, Smithsonian Institution, GEORGE E. STUART, FREDERICK G. VOSBURGH, JAMES H. WAKELIN, JR., GEORGE E. WATSON, Curator of Birds, Smithsonian Institution, FRANK C. WHITMORE, JR., Research Geologist, U. S. Geological Survey, CONRAD L. WIRTH, LOUIS B. WRIGHT, and PAUL A. ZAHL, Former Senior Scientist, National Geographic Staff

ASSISTANT SECRETARIES OF THE SOCIETY: Joseph B. Hogan, James P. Kelly, Adrian L. Loftin, Jr., Lewis P. Lowe, Ward S. Phelps, Cletis Pride

ASSISTANT TREASURER: Alfred J. Hayre. *Assistants to the President:* Earl Corliss, Jr., Richard E. Pearson. *Administrative:* D. Evelyn Carnahan, Janet C. Soper

SECRETARY'S STAFF: *Accounting:* Martha Allen Baggett, Dorothy L. Dameron, Jay H. Givans, Laura L. Leight, William G. McGhee, George E. Newstedt, David H. Peters. *Administration:* Ruth E. Clark, Frederick C. Gale, Robert V. Koenig, Zbigniew Jan Lutyk, Joyce S. Sanford, Karen F. Shrewsberry, Frank M. Twigger. *Computer:* James G. Schmelzer. *Educational Services:* Wendy G. Rogers, Carl W. Harmon, Jr. *Employee Benefits:* Howard R. Hudson, Mary L. Whitmore. *Explorers Hall:* Peter Purpura. *Membership Services:* Margaret L. Bassford, Robert C. Dove, Erma T. Goetzinger, William T. McDonnell, Jimmie D. Pridemore, Charles P. Thomas, Paul B. Tylor, Dorothy M. Wagner, Marguerite M. Wise, Peter F. Woods. *Personnel:* Thomas L. Hartman, M.D., Robert E. Howell, Glenn G. Pepperman, Shirley N. Wilson. *Printing:* Joe M. Barlett, Frank S. Oliverio, Wilhelm R. Saake, Hans H. Wegner. *Promotion:* Charles T. Kneeland, Robert J. Warfel, Eileen W. Bowering, Robert L. Feige, Joseph S. Fowler, Thomas M. Kent, F. William Rath, Towne Windom. *Purchasing:* Robert G. Corey, Thomas L. Fletcher, Sheila H. Immel

ADVERTISING: *Director:* James L. Till, 1251 Avenue of the Americas, New York 10020. *Asst. to Director:* Blanche Coffey. *Regional managers—Eastern:* George W. Kellner, New York. *Midwestern:* Robert R. Henn, Chicago. *San Francisco:* Cecil H. London. *Los Angeles:* Richard H. Lehman. *Detroit:* George E. Moffat. *Canada:* Robert W. Horan, New York. *International:* John F. Grant, New York. *Travel:* Gerald A. Van Splinter, New York. *European Director:* Michel A. Boutin, Paris. *Business Manager:* Peter W. Michaels. *Production Manager:* G. Sarita Lapham

COPYRIGHT © 1979 National Geographic Society, 17th and M Sts. N.W., Washington, D. C. 20036.

MELVIN M. PAYNE *Chairman of the Board*
ROBERT E. DOYLE *President of the Society*
MELVILLE BELL GROSVENOR *Editor Emeritus*

NATIONAL GEOGRAPHIC MAGAZINE

GILBERT M. GROSVENOR *Editor*

W. E. GARRETT *Associate Editor, Illustrations*
JOSEPH JUDGE *Associate Editor, Text*

SENIOR ASSISTANT EDITORS

James Cerruti, *Free-lance Articles*
Robert E. Gilka, *Photography*
Edward J. Linehan, *Manuscripts*
O. Louis Mazzatenta, *Layout*
Carolyn Bennett Patterson, *Legends*
Kenneth F. Weaver, *Science*
Herbert S. Wilburn, Jr., *Control Center*
Richard J. Darley, *Cartography*
William Graves, *Expeditions*
Samuel W. Matthews, *Production*
Howard E. Paine, *Art*
Thomas R. Smith, *Illustrations*
Ann K. Wendt, *Research*

TEXT

ASSISTANT EDITORS: Rowe Findley, Allan C. Fisher, Jr., Robert P. Jordan, Bart McDowell, Elizabeth A. Moize, Merle Severy

SENIOR WRITERS: Thomas J. Abercrombie, David S. Boyer, William S. Ellis, Howard La Fay, John J. Putman, Volkmar Wentzel, Peter T. White

SENIOR EDITORIAL STAFF: Harvey Arden, Kent Britt, Thomas Y. Canby, Mike Edwards, Boyd Gibbons, Rick Gore, Noel Grove, Alice J. Hall, Bryan Hodgson, Ethel A. Starbird, Gordon Young

EDITORIAL STAFF: Robert Booth, John L. Eliot, David Jeffery, Michael E. Long, John L. McIntosh, George E. Stuart, Priit J. Vesilind

RESEARCH: Frances H. Parker (Associate Chief); Carolyn H. Anderson, Susan L. Anderson, Judith Brown, Susan P. Byrnes, Susan Day Fuller, Ann B. Henry, Jan Holderness, Patricia B. Kellogg, Jean B. McConville, Jeanne E. Peters, Lesley B. Rogers, Frances W. Shaffer. *Style:* Michaeline A. Sweeney. *Geographic Information:* Bette Joan Goss. *Legends:* Abigail A. Tipton

ILLUSTRATIONS

PHOTOGRAPHERS: Dean Conger, Joseph J. Scherschel (Assistant Directors); James L. Amos, James P. Blair, Victor R. Boswell, Jr., Jodi Cobb, Bruce Dale, Gordon W. Gahan, David Alan Harvey, Otis Imboden, Emory Kristof, Bianca Lavies, Bates Littlehales, Robert W. Madden, George F. Mobley, Robert S. Oakes, Steve Raymer, Robert F. Sisson *(Natural Science)*, James L. Stanfield. *Administration:* John E. Fletcher, Guy W. Starling

ILLUSTRATIONS EDITORS: W. Allan Royce (Assistant Chief); David L. Arnold, Taylor Gregg, Declan Haun, H. Edward Kim *(Layout)*, Charlene Murphy, Robert S. Patton, Elie S. Rogers, Jon Schneeberger, Mary Griswold Smith *(Research Projects)*. *Picture Editor:* Bruce A. McElfresh

ART: William N. Palmstrom (Chief); Walter Q. Crowe, John D. Garst, Jr. (Assistant Chiefs). *Artists:* Lisa Biganzoli, William H. Bond, John W. Lothers, Robert C. Magis, Jaime Quintero, Ned M. Seidler. *Cartographic Artist:* Snejinka Stefanoff. *Map Editor:* John T. Blozis. *Research:* Virginia L. Baza, Harold A. Hanson, Dorothy A. Nicholson. *Production:* Isaac Ortiz (Supervisor); Iskandar Baday, Elie Sabban, Alfred L. Zebarth, Leo B. Zebarth

DESIGN: Charles C. Uhl, Robert E. Pullman, Betty A. Clayman

ENGRAVING AND PRINTING: Dee J. Andella (Director); William W. Smith (Assistant Director); John T. Dunn, John R. Metcalfe, James R. Whitney

CARTOGRAPHY

John F. Shupe (Associate Chief); Ted Dachtera, Richard K. Rogers (Assistant Chiefs); John F. Dorr (Art Director); Margery K. Barkdull, Charles F. Case, Russel G. Fritz, Charles W. Gotthardt, Jr., Thomas L. Gray, Catherine M. Hart, Donald A. Jaeger, Harry D. Kauhane, Mary Anne McAleer, Charles L. Miller, Robert W. Northrop, Charles L. Stern, Douglas A. Strobel, Tibor G. Toth, Thomas A. Wall, Thomas A. Walsh

EDITORIAL SERVICES

ADMINISTRATION: Joyce W. McKean (Assistant to the Editor), Elaine R. Chisman, Lilian Davidson, Virginia H. Finnegan, Mary F. Klemann, Lucille L. McInerney, Shirley Neff, Barbara A. Shattuck, M. Jean Vile. *Correspondence:* Carolyn F. Clewell, Clifford R. DuBois. *Indexes:* Jolene M. Blozis

PHOTOGRAPHIC LABORATORIES AND TYPESETTING: Carl M. Shrader (Chief); Milton A. Ford (Associate Chief); Lawrence F. Ludwig (Assistant Chief); Herbert Altemus, Jr., David H. Chisman, Ellwood M. Kohler, Jr., Geoffrey T. McConnell, William S. Petrini, Claude E. Petrone, Joan S. Simms (Assistant)

LIBRARIES: *Publications:* Virginia Carter Hills (Librarian); Patricia Murphy Smith, Carolyn Locke, Louise A. Robinson, Marta Strada. *Illustrations:* L. Fern Dame, Carolyn J. Harrison. *Records:* Lorie Northrop, Mary Anne McMillen. *Films:* Betty G. Kotcher

RELATED EDUCATIONAL SERVICES OF THE SOCIETY

SENIOR ASSISTANT EDITORS

Jules B. Billard, *Book Service*
Robert L. Breeden, *Special Publications and School Services*

BOOK SERVICE: Thomas B. Allen, Seymour L. Fishbein (Associate Chiefs); Ross Bennett, Constance Brown Boltz, Mary H. Dickinson, Robert C. Firestone, Mary Swain Hoover, Charles O. Hyman, Anne Dirkes Kobor, J. Edward Lanouette, Carol Bittig Lutyk, David F. Robinson, Shirley Scott, Margaret Sedeen, Verla Lee Smith

SPECIAL PUBLICATIONS AND SCHOOL SERVICES: Donald J. Crump (Associate Chief); Philip B. Silcott (Assistant Chief); William L. Allen, Jody Bolt, Toni Eugene, Ron Fisher, William R. Gray, Sallie M. Greenwood, Mary Ann Harrell, Suzanne J. Jacobson, Geraldine Linder, Tee Loftin, Louisa V. Magzanian, Tom Melham, Robert Messer, Jennifer C. Urquhart, Ursula Perrin Vosseler, George V. White, Merrill Windsor. *National Geographic WORLD:* Ralph Gray (Editor); Ellen Joan Hurst, Margaret McKelway, Pat Robbins, Eleanor Shannahan, Veronica Smith. *Books for Young Explorers:* Cynthia Ramsay. *Filmstrips:* Jimmie Abercrombie, James B. Caffrey, Margery G. Dunn, Jacqueline Geschickter, Jane R. McCauley, H. Robert Morrison, George Peterson, Judith E. Rinard, Joan Ann Straker

NEWS SERVICE: Paul Sampson (Chief); Donald J. Frederick, William J. O'Neill, Robert C. Radcliffe. **TELEVISION AND EDUCATIONAL FILMS:** Dennis B. Kane (Chief); Marjorie M. Moomey *(Research)*; Patricia F. Northrop *(Promotion)*; Sidney Platt *(Educational Projects)*; Yeorgos N. Lampathakis, Carl E. Ziebe. **LECTURES:** Joanne M. Hess (Chief); Robert G. Fleegal, Mary W. McKinney, Gerald L. Wiley. **RECORDINGS:** John M. Lavery (Chief). **AUDIOVISUAL:** Jon H. Larimore

Contents

Page

JULY 1978

EDITOR'S PAGE 1
THE GRAND CANYON 2
A portfolio by W. E. Garrett
ARE WE LOVING IT TO DEATH? 16
Article and photographs by W. E. Garrett
Double map supplement included—*The Heart of the Grand Canyon,* and photomosaic of the entire canyon
VOYAGER'S HISTORIC VIEW OF EARTH AND MOON 53
REGAL TREASURES FROM A MACEDONIAN TOMB 55
By Manolis Andronicos, with photographs by Spyros Tsavdaroglou
DAY OF THE RICE GOD 78
Photographs by H. Edward Kim, with text by Douglas Lee
A folk festival in rural Japan
YESTERDAY LINGERS ON LAKE ERIE'S BASS ISLANDS 86
Article and photographs by Terry and Lyntha Eiler
GIANTS THAT MOVE THE WORLD'S OIL: SUPERSHIPS 102
By Noel Grove, with photographs by Martin Rogers
SUPERSPILL: BLACK DAY FOR BRITTANY 124
Photographs by Martin Rogers, with text by Noel Grove
DAZZLING CORALS OF PALAU 136
Photographs by Douglas Faulkner, with text by Thomas O'Neill

AUGUST 1978

EDITOR'S PAGE 151
A NEW LOOK AT DINOSAURS 152
By John H. Ostrom, with paintings by Roy Andersen
ALUMINUM, THE MAGIC METAL 186
By Thomas Y. Canby, with photographs by James L. Amos
GEORGIA, UNLIMITED 212
By Alice J. Hall, with photographs by Bill Weems
NEW ZEALAND'S HIGH COUNTRY (SOUTH ISLAND) 246
Article and photographs by Yva Momatiuk and John Eastcott
NORWAY'S STRATEGIC ARCTIC ISLANDS (SVALBARD) 267
By Gordon Young, with photographs by Martin Rogers
MOUNTAIN GOATS: DARING GUARDIANS OF THE HEIGHTS 284
Article and photographs by Douglas H. Chadwick

SEPTEMBER 1978

EDITOR'S PAGE 297
SOLO TO THE POLE 298
By Naomi Uemura, with photographs by the author and Ira Block
SYRIA TESTS A NEW STABILITY 326
By Howard La Fay, with photogrtaphs by James L. Stanfield
Double map supplement included—*Middle East* and *Early Civilizations in the Middle East*
UNDERSEA WONDERS OF THE GALAPAGOS 363
By Gerard Wellington, with photographs by David Doubilet
A MOST UNCOMMON TOWN: COLUMBUS, INDIANA 383
Photographs by J. Bruce Baumann, with text by David Jeffery
THE JOY OF PIGS 398
By Kent Britt, with photographs by George F. Mobley
NEW MEXICO'S MOUNTAINS OF MYSTERY (SANGRE DE CRISTO) 416
By Robert Laxalt, with photographs by Craig Aurness

OCTOBER 1978 Page

EDITOR'S PAGE 437

CONVERSATIONS WITH A GORILLA 438
By Francine Patterson, with photographs by Ronald H. Cohn

DREAM ON, VANCOUVER 467
By Mike Edwards, with photographs by Charles O'Rear

LAND OF LONG SUNSETS: NEBRASKA'S SAND HILLS 493
By John Madson, with photographs by Jodi Cobb

DJIBOUTI, TINY NEW NATION ON AFRICA'S HORN 518
Picture story by Marion Kaplan

TRAVELS WITH A DONKEY—100 YEARS LATER 535
By Carolyn Bennett Patterson, with photographs by Cotton Coulson
Robert Louis Stevenson's trip through the Cévennes region of France is retraced

THE SUNKEN TREASURE OF ST. HELENA *(WITTE LEEUW)* 562
By Robert Sténuit, with photographs by Bates Littlehales

NOVEMBER 1978

EDITOR'S PAGE 577

PILGRIMAGE TO MECCA 581
By Muhammad Abdul-Rauf, with photographs by Mehmet Biber

WASHINGTON'S YAKIMA VALLEY 609
By Mark Miller, with photographs by Sisse Brimberg

NATURAL GAS: THE SEARCH GOES ON 632
By Bryan Hodgson, with photographs by Lowell Georgia

WHERE THE RIVER SHANNON FLOWS 652
By Allan C. Fisher, Jr., with photographs by Adam Woolfitt

THE NATIONAL GALLERY'S NEW MASTERWORK ON THE MALL 680
By J. Carter Brown, with photographs by James A. Sugar

TREASURES OF DRESDEN 702
By John L. Eliot, with photographs by Victor R. Boswell, Jr.

FLASHLIGHT FISH OF THE RED SEA *(PHOTOBLEPHARON)* 719
By Eugenie Clark, with photographs by David Doubilet

DECEMBER 1978

EDITOR'S PAGE 729

EBLA: SPLENDOR OF AN UNKNOWN EMPIRE 730
By Howard La Fay, with photographs by James L. Stanfield and paintings by Louis S. Glanzman

ONTARIO, CANADA'S KEYSTONE 760
By David S. Boyer, with photographs by Sam Abell and the author
Map supplement included—*Close-up: Canada: Ontario*

SMALLPOX—EPITAPH FOR A KILLER? 796
By Donald A. Henderson, with photographs by Marion Kaplan

TIGRIS SAILS INTO THE PAST 806
By Thor Heyerdahl, with photographs by Carlo Mauri and the crew of the *Tigris*

WINTERKEEPING IN YELLOWSTONE 829
Article and photographs by R. Steven Fuller

DOUBLE EAGLE II HAS LANDED! CROSSING THE ATLANTIC BY BALLOON 858
By Ben L. Abruzzo with Maxie L. Anderson and Larry Newman

Index VOLUME 154 JULY-DECEMBER 1978

July	pp.	1-150	October	pp.	437-576
August	pp.	151-296	November	pp.	577-728
September	pp.	297-436	December	pp.	729-882

Titles and illustrations in bold face

A

Abbadi, Samir 361
Abbe, Lake, Djibouti: Limestone spires **530-531**
Abbott, Arthur J. **492,** 493, 499, 503, 508
Abbott, Chris **492,** 493, **503**
Abbott, Diane **503**
Abbott, Kim **492,** 503
Abbott, Mike 503
Abbott ranch, Cherry County, Nebr. **492,** 493, 499, **502-503,** 508, **514-515**
Abdul-Aziz al-Saud, King (Saudi Arabia) 591
Abdul-Rauf, Aisha 581, 584, 585
Abdul-Rauf, Faisal 581, 584
Abdul-Rauf, Muhammad: ***Pilgrimage to Mecca.*** Nov., 581-607
Abell, Sam, photographer: ***Ontario: Canada's Keystone.*** Dec., 760-795
Abeyta, Bernardo 425
Abraham (patriarch) 340, 585, 589; Islam revealed to 581, 589; Migration theory: Dates given: Biblical scholars 736, Muslim scholars 736; Pilgrimages instituted by 581, 582; Sacrifice of Isaac (Bible) 600; Sacrifice of Ishmael (Koran) 589, 600; Shrine built by 582, 584, 585, 588, 589
Abruzzo, Ben L.: **Double Eagle II *Has Landed! Crossing the Atlantic by Balloon.*** Dec., 858-882
Abruzzo, Pat **872**
Academy Bay, Santa Cruz (island), Galapagos Islands 373, 379
Achkar, Philippe 349
Acri, Gordon 773
Adams, Leo **626;** Studio-home **626**
Adaptation: Kaibab squirrel 41, 44
Aden, Luc and Thérèse, and family **532**
Aden, Gulf of **826-827;** *Tigris* voyage, end of 812, 826, burning of ship 826, **827**
Adler, Leopold, II 241
Adobe buildings: Sangre de Cristo region, N. Mex. 416, **417,** 426, **430-431,** 436
Adolph Coors brewing company: Aluminum recycling 204
Aegae (ancient capital), Macedon 63, 64; Gallic sack of 63-64, 70
Afars (people) 519, 520, 523, **533**
Afran Zodiac (VLCC) 103, 124; Captain 103, 104, **104,** 117; Crew 117, size 107; Deadweight tons (dwt) 104; Navigational aids 103, **104,** 117; Size 103, 104
Africa: Routes around: East India trade 562, 564, oil tankers 107; Smallpox eradication 800; *see also* Djibouti
Agency for International Development (AID): Smallpox eradication 798, 804
Agricola (cabin cruiser) 656, 663, 664, 665, 667
Agriculture: Georgia 228, 229-230, **231, 238, 239;** Ontario 776-777, **777-779;** Pig farming 410, 411; Syria 338-339, **348-349, 352,** 353, 355, 357; ***Washington's Yakima Valley.*** By Mark Miller. Nov., 609-631; *see also* Cattle and cattle raising; Fruit and fruit growing; Rice growing; Sheep and sheep raising
Ahalt, Larry, and wife 204
Ahtanum Ridge, Wash. **624-625**
Air lift (vacuum device): Underwater archeology **568,** 570, 574
Aircraft **523, 582-583;** Amphibious 487; Boeing 747 **210-211;** DC-3 **301;** Floatplanes 468, **474;** Fokker trimotor 302; Ford Tri-Motor 90, **91,** 92; Gates Learjet **619;** Helicopters 17, 20, 28, **31,** 40, 41, 127, **190,** 271, 277, 278; Piper Super Cub 493, *Pogo* 16, 24, **26-27;** Ski-equipped 304, 309, **310,** 314, 317; *see also* Balloons
Akiyama, Kazuyoshi 491
Akkad (ancient empire): Conquests 326, Ebla **732-733,** 741, Sumer 748
Alaska: Methane-hydrate deposits 650; Natural-gas pipeline, proposed 634; North Slope oil production 635; Oil-pipeline terminal 104, 118; Supertankers **105,** 108, 118
Albertinum museum, Dresden, East Germany: Green Vault 706, **708,** 710, **712-713,** 717, curator 709-710, 713, 717
Albrechtsburg, Meissen, East Germany 711, 713
Albuquerque, N. Mex.: Balloonists 860, 882, **882**
Alcoa *see* Aluminum Company of America
Alcoholism research: Pigs 412-413
Aleppo, Syria 340-341, **358-359,** 731, 737; Roman road near **360-361**
Aleppo (ancient city): Ruins **358-359,** 737, **736-737**
Alert, Canada: Arctic expedition: Base camp **300,** 301, 319
Alexander the Great 55, 62, 76, 339; Ivory portrait **62,** 75
Algae: Galapagos Islands 363, 372, 374, 379; Hot springs 839, 845, 848; Lake Erie **93;** Red tide **824**
Algonquin Provincial Park, Ontario 788
Ali Maow Maalin 797, 804, **805**
Ali Sabieh, Djibouti: Refugee camp **528-529**
Allen, Lough, Ireland 661; Farmland near **658, 659**
Allerton, Michael 490-491
Allier River, France 548
Allosaurus (dinosaur) **155**
Allotment Act of 1877 624
Alloys: Aluminum 188, 193
Almeida, Dom Geronimo de 562, 566
Alphabet, Ugaritic 341, **754**
Al-Qalah, Aleppo, Syria 340
Alto, Ga.: Roadside stand **231**
Alumina 192, 195, 196, 198, 201, 656; Smelting: Diagram **192-193**
Alumina Partners of Jamaica: Strip mine **194-195**
Aluminum 151; ***Aluminum, the Magic Metal.*** By Thomas Y. Canby. Aug., 186-211
Abundance 192, 195
Aluminum objects 188, 200; Artwork 188, **198-199,** 200; Violin **200**
Automobiles, use in 189, 203, **205**
Bauxite 192, 194, 196, 198, 200-201; Mines **194-195,** 198; Reserves, world 200
Boats 186, **202-203,** 203
Casting 193, **196-197**
Construction industry 188, **206,** 207, **207**
Discovery 186, 193
Importance, strategic 186, 192, 200-201
Industry 186, 197, 201; Electricity needs 186, 189, 191, 193, 196-197; Plants **196-197**
Ores 192, 195, 201 *see also* Bauxite, *above*
Packaging 188, 189, 204, 208, **208, 209**
Properties 188-189, 203, 208, 209
Recycling 189, 193, 203-204, 208, **208,** 209, 211; Collectors 204, **208, 209;** Cost 189, 193, 204
Reflectivity 186, 188, 189
Research **195,** 198, 201, **208,** 209
Smelting: Diagram **192-193;** Discovery of process 196, 198; Electricity needs 186, 189, 191, 193, 196-197, 198; Pollution 198
Transmission cables, electric

186, **190-191**
Versatility 186, 188-189, 196
Weight advantages 188, 189, 191, 203, 204
Aluminum Company of America (Alcoa) 151; Founder 196, 198; Recycling 208; Research 198; Vice-president 197
Alunite: Aluminum ore, possible 195, 201
Amer, Hayel 339
American Agricultural Movement: Georgia support **234**
American Bureau of Shipping: *Amoco Cadiz* inspection 126
American Friends Service Committee: Migrant workers, report on 623
American Indian National Bank, Washington, D. C. 627
An American Retraces "Travels With a Donkey." By Carolyn Bennett Patterson. Oct., 535-561
American Sign Language (Ameslan): Chimpanzee communication 440-441, 449, 461; Gorilla communication 438, 440, **441, 456, 461,** "molding technique" **441,** 449
America's Cup race (1977): Aluminum craft 186, 203
Ames, Iowa: Resource-recovery plant 209, 211
Ameslan *see* American Sign Language
Amoco Cadiz (VLCC): Oil spill 1, 107, 108, 120, ***Superspill: Black Day for Brittany.*** By Martin Rogers. July, 124-135
Amoco Production Company 637; Natural-gas wells 638, 648, 650
Amorites 741
Amos, James L., photographer: ***Aluminum, the Magic Metal.*** Aug., 186-211
Amphitheater, Dresden, East Germany: Painting of **711**
Amsberry, Helen **511**
Amsterdam, Netherlands: Auction, East India cargo 574; Cannon maker 574; Rijksmuseum collection **575,** 576
Amundsen, Roald 268, 283, 302
Anadarko Basin, Okla.: Natural gas: Deep-basin wells 641, **650,** production 641, 648
Anasazi (Indians): Grand Canyon 38, 40, 41, granaries **39,** 40
Anatosaurus (dinosaur) **157,** *cover*
Anchor, stone: Sumerian **818**
Ancient Ebla Opens a New Chapter of History. By Howard La Fay. Dec., 730-759
Andersen, Roy, artist: ***A New Look at Dinosaurs.*** Aug., 152-185
Anderson, Maxie L.: **Double Eagle II *Has Landed! Crossing the Atlantic by Balloon.*** Dec., 858-882
Anderson, Patty **872**
Anderson, Ian and Betsy 254
André, Father **551,** 558
Andrée, Salomon 268
Andress, Max **385**
Andrew W. Mellon Foundation 683
Andronicos, Manolis **65; *Regal Treasures From a Macedonian Tomb.*** July, 55-77
Andrus, Cecil 27
Anesthetizing of animals: Burros, Grand Canyon 28, 30, deaths from drug 28, 31, **31;** Pig research **407**
Angermeyer, Fiddi 376
Anglesey, Wales: Supertanker port 123
Animal behavior: Mountain goats 285, 295-296; Pigs 400, 403, 405, 408, 409, 411, 414; *see also* Gorillas
Animal introduction: Grand Canyon 22, 23, 27, 30; New World: Churro sheep 434, 436, pigs 400
Animal studies: Research animals: Golden hamsters 340, pigs 400, **407,** 411-413; *see also* Gorillas; Mountain goats
Ankylosaurus (dinosaur) **156-157**
Annacotty, Ireland: Waterfalls **674**
Anorthosite: Aluminum ore, possible 195, 201
Antigonus Gonatas, King (Macedon) 58, 63, 64, 76
Anti-Lebanon Range *see* Sharqi, Al Jabal ash
Antoine, Gérard and Nöelle 539
Apatosaurus (dinosaur) *see Brontosaurus*
Appalachia (region), U. S.: Natural-gas reserves 641, 647, 649, 650
Apple growing: Niagara-on-the-Lake, Ontario **777; *Washington's Yakima Valley.*** By Mark Miller. Nov., 609-631
Frost emergencies **612,** 615
Harvesting 609, 610, **610**
Labor force 609, 610, **611, 612,** 618-619, 631
Orchards 609, **610-612,** 611; Acreage 610
Packing and shipping 611
Production figures 610, 611
Storage, controlled-atmosphere 611
Varieties and shapes 615, 617
Aqra, Jabal, Syria 341
Ar Raqqah, Syria: Experimental farms near 354
Arab-Israeli conflict 326, 327, 341, 343, 357, 360; Effects of 348, **357,** 360; Palestinian refugees 341, **342-343,** 343; Suez Canal closing (1967) 107
Arab nations *see* Saudi Arabia; Syria
Arafat, Plain of: Pilgrimages 585, 588, pilgrims **578-580,** 588, **594-595**
Aragón, John 432, 434
Aramaic language, Western: Malula, Syria 344, 349
Archaeopteryx (extinct bird) 164, 167, 178; Feathers 164, 168, 184, fossil impressions **169;** Skeleton 164, **169,** diagram **168**
Archeological Society of Athens, Greece: Macedon dig, 63
Archeology: Bahrain 816, finds 816, 817, **817,** 818; ***Ebla: Splendor of an Unknown Empire.*** By Howard La Fay. Dec., 730-759; Grand Canyon 28, 40, finds **18-20, 39,** 40, 41; *see also* Macedonian tomb
Archeology, underwater *see Witte Leeuw*
Architecture *see* Columbus, Ind.; National Gallery of Art
ARCO Fairbanks (supertanker): Valdez Narrows, Alaska **105,** 118
Arctic explorers 267, 268, 271, 272, 283, 297, **297,** 302; ***Solo to the Pole.*** By Naomi Uemura. Sept., 298-325
Clothing **299, 300,** 301, **304, 305,** 312, **312, 318, 324, 325,** *cover*
Communication 304, 316, 322, 324; Radio 304, **310-311,** 316
Distance traveled 302
Financing 301, 314, 323
Floes and leads 302, 309, **312-313,** 314-315, 316, 319
Food supplies 300, 309, 310
Map 302-303
North Pole **320-325**
Polar bear: Attack 300, 304, 305; Jawbone **305**
Sextant 312, 321, 322, **323**
Sled **300,** 301, 305, **306-308,** 309, **313, 316,** 316-317, **320**
Supply plane 304, 309, **310,** 314, 317, 319
Tent 300, 304, **304, 308, 310-311, 313, 323**
Traveling time 302, 307, 320, 324
Arctic Regions: Hydrate layers 647, 650, 651; *see also* Alaska; Arctic explorers; Svalbard, Norway
Ardnacrusha, Ireland: Hydroelectric plant 661, 669, 672
Argo Merchant (tanker): Oil spill 1, 108, 120-121
Arigna Collieries mine, Ireland **660**
Arizona *see* Grand Canyon; Grand Canyon National Park
Arkansas: Bauxite 196, 200; Natural-gas reserves 641
Arkoma Basin, Ark.-Okla.: Natural-gas reserves 641
Arktika (nuclear icebreaker) 302
Armenians: Kassab, Syria 341
Armor: Ancient Greek **60-61, 64-65, 71,** 72, 73; Gilded steel: Dresden collection **702-703**
Arp, Jean: Sculpture by **699**
Art: ***Art Treasures of Dresden.*** By John L. Eliot. Nov., 702-717; Interior decorating **626; *The National Gallery's New Masterwork on the Mall.*** By J. Carter Brown. Nov., 680-701; Pop art: Automobile decoration **626;** *see also* Art, primitive; Artwork, ancient; Chinese art
Art, primitive: Figures, willow-

shoot **20,** 41; Pottery **19;** Rock paintings **18-19**
Art restoration: Dresden treasures 705, 709, 717
Artwork, ancient **405,** 735, 741, 752; Carvings **735, 740;** Ceramics **738;** Sculpture **735, 738, 740, 744, 754;** *see also* Macedonian tomb
Asbestos suit, aluminized 186, **189**
Ashurnasirpal II, King (Assyria): Wars, cruelty of 741
Asia: Smallpox 800, 804; *see also* Japan; Middle East and Near East
Asia Minor: Invasion (336 B.C.) 57, 62
al-Assad, Hafez **327,** 333
Assad, Lake, Syria 353-354
Assal, Lake, Djibouti **524**
Assamo, Fort, Djibouti **522**
Assyria (ancient empire): Warfare 326, 741
Atchafalaya River, La.: Pipelines spanning **640**
Athlone, Ireland 665, 667; Pub-owner 663
Atlanta, Ga.: Center for Disease Control **223,** 798, 800; ***Georgia Unlimited.*** By Alice J. Hall. Aug., 202-245; Primate research center 451
Atlantic Ocean: Balloon flights, attempted 864, 870-871; *see also Double Eagle II, outlined*
al-Atrash, Taha 354, 360
Auctions: Cattle 507, **512-513;** East India cargo 574; Federal Government **512-513**
Augusta, Ga. 229; Masters Golf Tournament 215, **226-227,** 229, 242
Augustus II, Elector (Saxony) and King (Poland) 704, 706, 709, 710, 711, 712
Augustus III, Elector (Saxony) and King (Poland) 704, 713, 714; Sculpture of 714
Aurand, René and Gaby 546
Aureng-Zeb (Indian ruler): Model of court 706, **712-713**
Aurness, Craig, photographer: ***New Mexico's Mountains of Mystery.*** Sept., 416-436
Aurora, Ontario: Horse-show contestant **772**
Australia: Bauxite 194, 198, 200
Automobiles: Aluminum use 189, 203, **205**
Avalanches: Mountain-goat casualties 293; Prevention: Yellowstone National Park 856
Aymara Indians: Reed-ship construction **808, 810-811,** 815

B

Baath Party: Syria 333, 343
Bab el Mandeb (strait), Red Sea–Gulf of Aden 519
Babylon (ancient city) 757, 759; Ruins 757, 759; Warfare 326
Baby's rattle, aluminum and gold **199**
Bach, Johann Sebastian: Work of 702, 717
Bacteria, light-emitting 719, 720, 722
Baghdad, Iraq 759; Sumerian records 813
Bahrain 816; Archeological finds 816, 818; Burial mounds **816-817;** Ruins **817;** *see also* Dilmun
Bailey, Bob and Marian 411
Bakalakis, George 63
Baker, Norman 815, **820**
Bakker, Robert 162, 174, 178, 184
Bal, Elma 419
Ball, Arthur 225
Ball-bearing company: Gainesville, Ga. 225-226
Balla (ancient town), Macedon 63
Ballinasloe, Ireland: Ballinasloe steeds 663; Great October Fair **662-665,** 676
Balloons: Transatlantic flights, attempted 864, 870-871; **Double Eagle II *Has Landed! Crossing the Atlantic by Balloon.*** By Ben L. Abruzzo with Maxie L. Anderson and Larry Newman. Dec., 858-882
Bangladesh: Smallpox 804
Baniyas, Syria: Oil refinery 348
Banu, Rahima 804
Bardari, Pasquale 127, 128
Barents, Willem 267, 271
Barents Sea, Arctic Ocean 274, 276, 281
Barentsburg, Spitsbergen, Norway: Name origin 271; Natural refrigeration **270;** Soviet community 271, **271,** 277, 278
Barnes, Margaret Anne 224
Barron, Harris: Sculpture by **393**
Baruch, Simon and Renee 245
Baseball: Toronto, Ontario 776
Bass Islands, Ohio: ***Yesterday Lingers on Lake Erie's Bass Islands.*** By Terry and Lyntha Eiler. July, 86-101
Airline 90; Tin Goose (airplane) 90, **91,** 92, crash 90, 92
Ferry service 86, **98**
Fishing: Commercial 88, **92,** 95, 99; Sport: Bait seller 86, 88, **92,** ice fishing 100, **100**
Location 88; Map 89
Major islands 86, **98-99**
Name origin 98
Ownership 86
Sailing 97; Race **96;** Yachtsman **87**
Summer visitors 86, 89, **97**
Wine industry 90, 92, 94-95; Vineyards **94-95**
Le Bateau Ivre (inn), Le Puy, France 539
Baton Rouge, La.: Natural gas: Geopressure wells 638, blowout 638, **638**
Battelle Pacific Northwest Laboratories, Richland, Wash.: Pig research **407**
Battle, naval: St. Helena, South Atlantic Ocean 562, 563, **564-565,** 566, 570, 576
Battlebridge, Ireland 652, 656
Baumann, J. Bruce, photographer: ***A Most Uncommon Town: Columbus, Indiana.*** Sept., 383-397
Bauxite 192, 194, 196, 198, 200-201, 656; Name origin 192; Refining: Diagram **192-193;** Reserves, world 200; Strip mine **194-195,** 198
Baybars, Sultan (Egypt): Crusaders, defeat of 345
Bazaars: Aleppo, Syria 340; Damascus, Syria 333, **334,** 335
Beach formation: Colorado River 22, 23
Beagle III (research vessel) 373, 376
Bears: Black 832; *see also* Grizzly bears; Polar bears
Beaufort Sea, Arctic Ocean: Methane hydrates 650
Beckwith, Wendell **780, 781;** "snail home" **781**
Bedouin 353, **354-355**
Beebe, William 374; Quoted 374
Beef production: Economics of 507-508; Sand Hills, Nebr. 498, 517
Beehive houses: Syria **336-337**
Beer making: Hops 618, **620-621**
Bel Air (hotel), Langogne, France 542, 544
Belford, Eric 781
Bellamya (ULCC) 123-124; Bridge **106,** 123; Crew **106, 107,** 123; Deadweight tons 107, 123
Bennett, Floyd 268, 283, 302
Bentley, Dave and Pat 789
Beresford, John: Quoted 405
Bergman, Bernard P. **305**
Berthier, Monique 561
Besson, Régis **552**
Bethlehem, Ga. **233**
Bibby, Geoffrey 816, **817,** 818
Biber, Mehmet, photographer: ***Pilgrimage to Mecca.*** Nov., 581-607
Biblical studies: Ebla tablets, impact of 733, 736-737, 740, 748
Biglane, Kenneth 118, 120, 134
Bioluminescence *see Photoblepharon*
Birchwood Station, South Island, New Zealand 249, 251, **255**
Bird, Roland 162
Birds: Bird hospitals: France 134; Boobies, red-footed 379; Canada geese **490-491;** Dinosaurs possible ancestors of 152, 164, 166, 167, 168, 178, 184; Endothermy 178, 184; Evolution: Diagram **166;** Extinct 17; Georgia 229, **229,** 235; Oil-spill victims 124, 134, cormorant **135;** Penguins 372, 379; Svalbard, Norway 282, **282-283;** Swans, trumpeter **840-841**
Birmingham, England: Laboratory-contracted smallpox 797, 800
Bishop, Dick 570

Black Day for Brittany (oil spill). By Martin Rogers. July, 124-135
Black Forest Station, South Island, New Zealand **250,** 251, 259; Fire 251, 264; Woolshed **251**
Black Stone: Kaaba, Mecca 585, **592**
Blackamoor: Statue of **708,** 710
Blackstein, Fred 790-791
Blanch, José Maria 416
Blankets, aluminized 186, **188-189**
Bleekrode, R. K. 124
Blizzard of 1879: Sand Hills, Nebr.: Cattle episode 501, 510-511
Block, Ira **297;** photographer: ***Solo to the Pole.*** Sept., 298-325
Blunt, Frances 249
Boar, European wild 403, **404,** 411
Boats: Aluminum 186, **202-203,** 203; Dories 44, 45, **46-47, 49;** Fishing boats **228, 240-241,** 489, oil-damaged **132-133;** ***Grand Canyon: Are We Loving It to Death?*** By W. E. Garrett. July 16-51; Inflatable boats **5-6, 40,** 45, outboard motor using **40;** Jet-boat inventor 259; *see also* Shannon, River
Bogert, Charles 176
Böhn, Hans Peter **820, 821**
Bonneville Power Administration, Oreg.: Transmission cables, aluminum **190-191**
Boru, Brian 672, 676, 679
Boswell, Victor R., Jr., photographer: ***Treasures of Dresden.*** Nov., 702-717
Botanical garden: Vancouver, British Columbia **488-489**
Böttger, Johann Friedrich 711; Porcelain designs by **707,** 711
Boulder City, Nev.: Aluminum research **195,** 201
Bournemouth, England: Aerial view **868-869**
Boyer, David S.: ***Ontario: Canada's Keystone.*** Dec., 760-795
Boyles, Art 100
Brachiosaurus (dinosaur) **155-156, 170,** 171; Size 170, 171, comparison diagrams **155-156, 176**
Bradford, Richard 420
Brands, cattle: Sand Hills, Nebr. **498, 503**
Brendan the Navigator 656
Bretz, Leslie 94
Brimberg, Sisse, photographer: ***Washington's Yakima Valley.*** Nov., 609-631
Brine fly 848
British Columbia: Natural resources 487, forest products 468, **472-473,** 478, 487; *see also* Vancouver, *outlined*
British Somaliland, former 521
Britt, Kent **401;** ***The Joy of Pigs.*** Sept., 398-415
Brittany (region), France: Oil spill (1978) 1, 107, 108, 120, ***Superspill: Black Day for Brittany.*** By Martin Rogers. July, 124-135
Brock, Norris 821
Broggio, André 536; Family 539, 540
Brontosaurus (dinosaur) **155-157, 180-181;** Size 180
Bronze: Ancient Macedonian 57, **60-61, 64-65,** 73, 75; Sculpture **682,** 694
Bronze Age, early *see* Semitic cultures
Brown, J. Carter **688;** ***The National Gallery's New Masterwork on the Mall.*** Nov., 680-701
Bruce, Ailsa Mellon 683
Bruce complex (nuclear plant), Ontario, Canada 790
Bryan, George 650-651
Buckland, William 167
Buffalo: Yellowstone National Park 829, **836-837,** 839, **847,** 856, winterkill 839, 856
Bullington, John 228-231
Burial mounds: Bahrain **816-817;** *see also* Macedonian tomb
Burke, Stanley: Float home **474**
Burmeister, Slim 436
Burnaby, British Columbia: Mayor **482**
Burns, Peter, and son 672
Burrard Inlet, British Columbia **466-467,** 467, **470-471,** 472, 490
Burris, Dale 94
Burros, Grand Canyon 24, 27, **31;** Airlifted from park 28, **31;** Auctioning of 28; Damage caused by 27, 30, **30;** Destruction of, halted 27, 30, cost of alternatives 27-28, 30, 31
Busbee, George 214
Bush, Geri **496, 497**
Bushpig **404**
Byrd, Richard E. 268, 283, 302

C

Cacciuttolo, Antonio 103, 104, **104,** 117
Caird, Donald **668**
Calder, Alexander: Mobiles by 188, **680-681,** 683, **686-687,** 694, 698, 701
Calendars: Ebla 750; Islam 585, 587, 588
Camels **526**
Camisard War 553, 554, 555, 560
Camptosaurus (dinosaur) **156**
Canaanite cultures: Eblaite influence 740, 749, 754
Canada: Immigration policies 482; Indian affairs 782, 784, 787; *see also* Ontario, *outlined*; Vancouver, British Columbia, *outlined*
Canadian National (CN) Tower, Toronto, Ontario **762;** View from **762-763**
Canby, Thomas Y.: ***Aluminum, the Magic Metal.*** Aug., 186-211
Canby, Vert and Yellott 204
Cannons **567,** 569, 570, 574, 576
Cans, aluminum 188, 189, **208, 209;** Recycling 189, 193, 204, 208
Canyon Village, Yellowstone National Park 832, 848, 849
Canyons *see* Grand Canyon, Ariz.
Cape Coral, Fla.: Aluminum-can collector **209**
Carchemish (ancient city): Seal **754**
Cárdenas, Don García López de 32, 44
Carlsen, Anker 272-273
Caroline Islands *see* Palau Islands
Carranadoe Lough, Ireland 663
Carrasco, German **820**
Carrick on Shannon, Ireland 656, 663; Aerial view **654-655**
Carter, Billy 216, **216;** Gas station **216**
Carter, Hugh 216; Shop **217**
Carter, Jimmy 213, 214, 216-217, 220, 245
Carter, Lillian 245
Cartography *see* Mapmaking
Cascade Mountains, U. S.: Yakima Valley's water supply and 609-610
Caskets, gold: Ancient Macedonian tomb **55,** 57, **67-69,** 75, 76
Casting, aluminum 193, **196-197**
Castles: France: Ruins **545, 546,** 547; Ireland **677,** ruins 672; Krak des Chevaliers, Syria 344-345
Catawba grapes 92, 94; Vineyard **94-95**
Cattle and cattle raising: France: Market **542-543;** ***Land of Long Sunsets: Nebraska's Sand Hills.*** By John Madson. Oct., 493-517; New Mexico 428, 434, 436; River Shannon region, Ireland 656, 658, **658,** 661, 664, 665; South Island, New Zealand 248, 251, 254, 263; Syria 354
Cavadas, John 487
Cave of Sorrows, St. Germain de Calberte, France 560
Center for Advanced Study in the Visual Arts, National Gallery of Art, Wash., D. C. 688; Under construction **688**
Center for Disease Control, Atlanta, Ga. **223;** Smallpox eradication 798, 800
Center for Lake Erie Area Research (CLEAR) 99
Ceraland (recreation area), Columbus, Ind. **392**
Ceramists *see* Potters
Cévennes (region), France: ***Travels With a Donkey—100 Years Later.*** By Carolyn Bennett Patterson. Oct., 535-561
Cévennes Mountains, France **556-557;** Mont Lozère **536-537**
Chadwick, Douglas H.: ***Mountain Goats: Daring Guardians of the Heights.*** Aug., 284-296
Chadwick, Elizabeth Fuller 289
Chadwick, Karen Reeves 284
Chaeronea (ancient city), Epirus 75
Chalk River Nuclear Laboratories, Ontario 790-791
Chambliss, Sue 216

Champion, Charles A. 118
Chanute Air Force Base, Ill.: Fire fighter **189**
Chapel of the Sacrament, Katolische Hofkirche, Dresden, East Germany: Art restoration 717
Charles Darwin Research Station, Santa Cruz (island), Galapagos Islands 371, 373
Charleston, S. C.: Harbor **633**
Chasseradès (village), France 548; Countryside near **556-557**
Château Beaufort ruins, Goudet, France: Sketch of **545**
Chattooga River, Ga. 227
Chayla, Abbé du 554
Cheechoo, Vern **787**
Chehem, Hassan, and father **533**
Cherry County, Nebr.: ***Land of Long Sunsets: Nebraska's Sand Hills.*** By John Madson. Oct., 493-517
Chess: Chessmen, models for **842,** 848; Norwegian-Soviet competitions 278, **279**
Chester Whites (swine breed) **412-413**
Chesterton, G. K.: Quoted 410
Chevron Brussels (VLCC) **102-103**
Chevron U.S.A.: Natural-gas well blowout 638, **638**
Cheylard l'Évêque, France **539,** 546
Chili peppers 422, **426,** 436
Chimayo, N. Mex. 416, 421, 422, 423; Barrios 419; Shrine 418, 425, 426, 432, **432**
Chimpanzees: Communication 438, 440-441, 449, 451, 461; Goodall study 437; Hayes study 441
Chinatown (district), Vancouver, British Columbia 476, 478
Chinese (people): Potters, 16th- and 17th-century 570, 574, 576; Vancouver, British Columbia 476, 478, 480, 482, 485, **485**
Chinese art: Ming Dynasty porcelain **563,** 568, 570, **571-573,** 574, **575,** 576
Chingtechen, China: Porcelain 570, 574
Chisholm, Illian **434**
Chiyoda, Japan: ***Day of the Rice God*** (festival). By J. Edward Kim. July, 78-85
Christmas: New Mexico **422,** 423; Syria **347;** Yellowstone National Park 849
Churches: Columbus, Ind. **385, 390, 391;** Dresden, East Germany **704-705,** 707, 709, 714, 717
Churro sheep: Brought to New World 434-435
Ciarán, Saint 665, 667
Circle Oaks Farm, Elora, Tenn.: Pigs **402-403**
City-kingdoms 337, 340, 341, 350, 353; ***Ebla: Splendor of an Unknown Empire.*** By Howard La Fay. Dec., 730-759; ***Tribes to Empires: The Growth of Civilization.*** Sept. supplement
Civilizations, early 326, 327, 337, 341, 358; **Tigris *Sails Into the Past.*** By Thor Heyerdahl. Dec., 806-827; ***Tribes to Empires: The Growth of Civilization.*** Sept. supplement; *see also* Ebla; Sumerians
Clarendon Lock, River Shannon, Ireland 661
Clark, Eugenie **722;** ***Flashlight Fish of the Red Sea.*** Nov., 719-728
Claudius, Abbot 548
Clay County Fair, Spencer, Iowa **412-413**
Clay tablets *see* Cuneiform tablets
Clayton, Ga. 242; Country store **230-231;** Potato harvest **238**
Cleanup, man-powered: Oil spill **125, 130,** 133
Cleary, John, and mother 679
Cleland, Max **221**
Cleopatra (wife of Philip II of Macedon) 67, 76; Portrait, possible **74;** Tomb, possible 67, **66-67,** 76
Clocks: Dresden artworks **716, 717;** Steam-powered 475, **477**
Clonmacnoise (monastery) ruins, Ireland 657, 667, **668,** 669
Coal: Gas made from 634; Ireland 657, **660,** 661; Ontario, Canada 782; Svalbard, Norway 267, 268, 269, 272, 274, 283, processing plant **272**
Coal seams: Natural gas 632, 645, map locating 645-647, reserve estimates 632, 645, 649
Cobalt-oxide pigments: Pottery 570, 574
Cobb, Jodi, photographer: ***Land of Long Sunsets: Nebraska's Sand Hills.*** Oct., 493-517
Coburn, Hod 849
Coca-Cola bottling plant: Djibouti **533**
Cody, Nebr. **506-507**
Coelophysis (dinosaur) **155**
Cohn, Ronald H., photographer: ***Conversations With a Gorilla.*** Oct., 438-465
Coins, ancient Greek **66-67,** 76
Colbert, Edwin 176
Collinsworth, Even 436
Collum, Herbert 717
Colorado: Fossil sites 167, 171, **177;** Gas field, largest **637,** 648
Colorado River, U. S.:
The Grand Canyon. July supplement
Grand Canyon. By W. E. Garrett. July, 2-15
Grand Canyon: Are We Loving It to Death? By W. E. Garrett. July, 16-51
Beaches **22, 46-47;** Deteriorating 22, 23
Boat trips 17, 22, 45, 51; Inflatable rafts **5-6, 40,** 45; Mismanagement, charges of 17, lawsuit 17, 26, recommended solutions 20, 26-27, 40; Motorboat controversy 22-23, 40; Wooden boats (dories) 44, 45, **46-47, 49,** 51
Damming: Changes with *supplement,* fish life 22, 23, flow reduced 20, 22, 23; Construction halted 20, 25, 44
Exploration: First 32; Powell expedition 32, 44
Geological history *supplement*
Rapids **4-6,** 16, 20, 22, 23, 45, **49,** 51
River runners, annual number of 17, 46
Satellite monitoring 23
Silt transport **4-6,** 16; Pre-dam statistics 23, *supplement;* Reduction in, effects of 22, 23
Columbia, Cape, Canada: North Pole expedition 302, 304, 312, 314
Columbia River system, Canada-U. S.: Hydroelectric dams 191, 197
Columbus, Christopher 400
Columbus, Ind.: ***A Most Uncommon Town: Columbus, Indiana.*** By J. Bruce Baumann. Sept., 383-397
Aerial view **384-385**
Architecture **382,** 383, **387, 396-397;** Churches **385, 390, 391;** Schools 386, **388-389**
Mayor **385**
Colvin, Sidney 561
Comanche Livestock piggery, Strasburg, Colo. 410
The Commons, Columbus, Ind. **382,** 383
Communication, animal: ***Conversations With a Gorilla.*** By Francine Patterson. Oct., 438-465; *Photoblepharon* 720, 728
Comprehensive Employment and Training Act (CETA) 222
Compsognathus (dinosaur) **156,** 164, 178; Posture 174
Computer applications: Glen Canyon Dam, Ariz.: Water-flow control 20, 23; Primate research 451, 454, 462; Supertankers: Safety devices 123-124, simulators **118-119,** 121
Conlon, Mai 661, 663
Connecticut: Fossil footprints 162
Conservation practices: Ranchers 508; River runners, professional 44, 46; *see also* Recycling
Constable, Tom **482**
Construction industry: Aluminum 188, **206,** 207, **207**
Continental drift: Dinosaur-extinction theory 182, 184
Continental shelf: Svalbard, Norway 276, map 268
Conversations With a Gorilla. By Francine Patterson. Oct., 438-465
Cook, Frederick A. 297, 302
Cook, Harold 638-639
Cook, James 249
Copper: Aluminum alloy 193; Oman, ancient 812, 818, mine,

remains of **819,** 825; Recycling 204
Coquerel, Rachel and Roger **881**
Coral World (aquarium), Elat, Israel 722, 726, 728; Curator 720, 722, **723**
Corals:
Dazzling Corals of Palau. By Douglas Faulkner. July, 136-150
Deepwater coral **150**
Feeding habits 138, 139, 148; Nightfeeders **149**
Island formation 140-141, 143
Polyps: Contracted **138, 144-145, 149;** Emergent **139, 142-143, 145, 148, 149**
Skeleton formation 143
Soft corals **138-139, 144-145, 148-149**
Species, number found 137
Stony corals **136-139, 142-143, 150**
Threats to 136-137, 147, 150; Enemies 145
Galapagos Islands **370,** 372; Polyps **377,** 380
Red Sea reefs 720, **720, 722-723**
Cordele, Ga. 228, 229
Cordell, Wiley 617
Cordova, N. Mex 422, 432
Corn: Georgia 216, 229, 230, 235, drought- and pest-damaged **239;** Pig consumption of 411, 413; Primitive 18, 41
Cornwall, England: Oil spill (1967) 108, 121
Coronado, Juan Vásquez de 430
Corselet (body armor), ancient Macedonian **71,** 72, 73
Cortés, Hernán 797
Cortial, Louis **540**
Corythosaurus (dinosaur) **157, 179**
Costa, Paulo 818, 824-825
Costaros, France: Cattle market **542-543**
Costelloe, John 669
Cotton: Syria 339, 341, 346, **352**
Coulson, Cotton, photographer: ***Travels With a Donkey—100 Years Later.*** Oct., 535-561
Court trial: Ancient Nippur 757
Cow manure: Methane produced from 651
Cowboys: New Mexico **428,** 429, 436; Sand Hills, Nebr. 493, 499, **501,** 505, 510, 516, Texas drovers 511, 512, women ranch hands **510, 511**
Cowles, Raymond 176
Cowpox vaccine 798, 801
Coyotes: Yellowstone National Park 839, 846, 856, bones **846**
Craighead, John 22, **23**
Cranach, Lucas, the Elder 713
Cree Indians: Ontario 782, 784, **786,** 787, **787,** 788
Crosses: Chimayo, N. Mex. **423**
Crossing the Atlantic by Balloon *(Double Eagle II)* By Ben L. Abruzzo with Maxie L. Anderson and Larry Newman. Dec., 858-882
Crotty, John **678**
Crucifix, carved wooden: Potrero, N. Mex. 425-426, **432**
Crucifixion, reenactment of: New Mexico 420, 430, 432
Crusaders: Baybars' defeat of (1271) 345; Jerusalem: Rout of Muslims 333; Orders 343, 344; Syria, conquest and rule of 326, 343-344, fortress 344-345
Cryolite: Aluminum smelting 193, 196, 198
Cuban aid: Ethiopia 520
Culpepper (island), Galapagos Islands 379, 380
Cummins Engine Company: Columbus, Ind. 386, **387,** 388, 392, 397, founder 386
Cundiyo, N. Mex. 422-423
Cuneiform tablets 340, 341, 353, 811, 813; ***Ebla: Splendor of an Unknown Empire.*** By Howard La Fay. Dec., 730-759
Curtis, Stanley 414
Cyprus 729

D

Dahlman, Jim 510
Dahood, Mitchell 737, 740, **749**
Dale, O. C. **49,** 51
Dale, Regan 45, 51
Damascus, Syria 326, **328, 329,** 333-337, 357, 360; Aerial view **330-331;** Bazaars 333, **334,** 335; Muslims 333; Population 332, 333; Urban renewal **330-331,** 333
Damhus, Asbjörn 821, **821**
Dams: Colorado River 25, 44, construction halted 20, 25, 44, detriments of 20, 22, 23; Euphrates 327, **338,** 339, 353-354; Hydropower 151
Dancers and dancing: Belly dancing **484;** Cévenol folk dance 541; Flower-hat dancers **78-79**
Dar Ta Izzah, Syria: Farming near **348-349**
Darwin, Charles 371, 380
Daubenthaler, Therese **209**
David (name): Ebla tablets 733, 736
Davis, Kathy 791
Davis, William **765,** 782, 791, 794
Davy, Sir Humphry 193, 196
Day of the Rice God (festival in Japan). By H. Edward Kim. July, 78-85
Dazzling Corals of Palau. By Douglas Faulkner. July, 136-150
Deep basins: Natural-gas source 632; Map locating 645-647; Wells 641, 648, **650,** 651, drilling problems 641, 645, 651
Deer Creek, Ariz. **43**
Deighton, John ("Gassy Jack") 475; Statue of 476
Deinocheirus (dinosaur): Discovery 170-171; Size 171
Deinonychus (dinosaur) **156, 160-161,** 162, 178; Claws 158, **160,** 161-162, 164, diagram **161;** Discovery site 152, 158, **158-159;** Posture 174; Size 160; Skeleton 158, **161,** 164
Deities: Ancient Middle East **740,** 741, 745, 754, 755, 757, Jehova (Yaweh) 737, 740; Greek **54,** 70
Delap, Bill 648
Delauze, Henri 566
Delaware Basin, Tex.: Natural gas 641
Delesalle, Philippe 121
Delft pottery 570, 574
Demarchi, Ray 296
Demeter (Greek goddess) 70
Derg, Lough, Ireland **666,** 667; Farmhouses near **670-671**
Desertification, causes of: Overgrazing by sheep 44; River course, shifting of 755, 757
Deul, Maurice 649
Devonian shales: Natural-gas source 632, 647, 649
Dhahan, Budhsingh 482-483
Diab, Ali 326
Diab, Muhammad, and wife **354-355**
Diadema (sea urchin) 727, 728
Diadems, gold and silver: Macedonian royalty **57, 61,** 72, 76
Dias, Martin E. 441, 449
Dickey, James 224, 227
Dictionary, bilingual (Eblaite-Sumerian) 734, 749
Dicynodonts (reptiles): Posture 174
Dilmun (ancient land) 811, 812; Trade center 816, 817, 818, 825
Dingle Burn (river), South Island, New Zealand 249
Dinglinger, Johann M.: Goldwork by 706, **708,** 710, **712-713**
Dinosaur National Monument, Colo.–Utah: Finds 172; Gallery **172-173**
Dinosaur State Park, Conn.: Fossil footprints 162
Dinosaurs: ***A New Look at Dinosaurs.*** By John H. Ostrom. Aug., 152-185
Birds possible descendants of 152, 164, 166, 167, 168, 178, 184
Bones **163, 170, 174-175,** 176, **179, 181, 183, 185;** Tissue 176, 182, **182;** *see also* Fossils; Skeletons, *below*
Ectothermy theory 152, 171, 172, 173, 176
Endothermy theory 152, 160, 164, 168, 171, 172-173, 174, 176, 178, 182, 184
Evolution 164; Diagram **166**
Extinction 152, 178; Theories 178, 182, 184, 185
Food consumption 171, 172, 174, 178
Fossils: Bones 152, 158, **160,** 162, **166,** 167, 170-171, **172-173, 177** *see also* Skeletons, *below;* Earliest find 167; Footprints 162, 170; Formation 172; Sites 152, 158, **158-159,** 162, 167, **177**

Homiothermy theory 176, 178, 181
Hunting methods 161-162, 164
Name meaning 167
Posture 173-174
Predator-prey ratio 174
Range 170
Size 160, 162, 164, 170, 171, 176, 180; Comparative diagrams **155-157, 176;** Largest known 167, 171, 172, 176
Skeletons **161,** 161-162, 164, 168, **168, 174;** Fossils **152-154,** 164, **165, 169,** 172
Diplodocus (dinosaur) **155-157**
Diseases: Chicken pox 797; Epidemics, former at hajj 603; Malaria 222; Measles 798; *see also* Smallpox, *outlined*
Distilling, mint-oil 617
Djibouti, Republic of:
Djibouti, Tiny New Nation on Africa's Horn. By Marion Kaplan. Oct., 518-533
Afars (people) 519, 520, 523, **533**
Capital *see* Djibouti (town)
Economy 519, 520, 525, 533
Education 533
Facts and figures 520
Flag 519, **520**
The French 519, 523, **528-529**
History 519, 520
Independence 519; Independence Day **518-519**
Location, strategic 519, 520
Map 520
Military forces 519, **522, 523, 528-529**
Issas (people) 519, 520, 523, **525**
President *see* Hassan Gouled Aptidon
Refugee camp **528-529**
Unemployment 519, 533
U. S. aid 528
Water holes 523, **526,** 527
Smallpox-eradication campaign 797
Tigris, burning of 826, **826-827**
Djibouti (town), Djibouti 519, 520, **521, 524-525**
Dobbs, Joe 773, 776
Dogs: **208, 255;** "catch-dogs" 403; Labrador retriever **257;** Sheep dogs **246-247, 251,** 254, **260-261,** border collies 254, 257; Truffle hunters 408, 410; *see also* Sled dogs
Dogsled trip: ***Solo to the North Pole.*** By Naomi Uemura. Sept., 298-325
Dolphins: Bottlenose 363; Common 377
Donkey trek: ***Travels With a Donkey—100 Years Later.*** By Carolyn Bennett Patterson. Oct., 535-561
Dories: White-water trips 44, 45, **46-47, 49**
Doubilet, David, photographer: ***Flashlight Fish of the Red Sea.*** Nov., 719-728; ***Undersea Wonders of the Galapagos.*** Sept., 363-381
Double Eagle (helium balloon) 859, 860, 865, 870, 871
Double Eagle II (helium balloon): **Double Eagle II *Has Landed! Crossing the Atlantic by Balloon.*** By Ben L. Abruzzo with Maxie L. Anderson and Larry Newman. Dec., 858-882
Altitude of flight 861, 864, 865, 866, 868, 874; Diagram **870-871**
Ballast 859, 861, 864, 865-866, 870-871, 877
Communications **861,** 864-865, **869,** 872, 874, 880, 882
Construction of 860, 864-865
Duct **860;** Diagram **866**
Duration of flight 871, 882
Gas envelope **860,** 864, 865, 866, **866, 867,** 870; Capacity 860; Diagram **866**
Gondola 859, **861, 877,** *cover;* Diagram **866**
Hang glider 859, **860,** 872
Landing **858-859,** 871, **876-879,** 881, 882
Launch 859, **860,** 870
Oxygen masks **862,** 865, **869**
Piloting 865-866, 874; Diagram **870-871;** Pressure systems 864, 865, diagram **871;** *see also* Ballast, *above*
Supplies 865, **869**
Weather shield **861, 866, 869;** Temperature raised by 869
Dream On, Vancouver. By Mike Edwards. Oct., 467-491
Dresden, East Germany: ***Treasures of Dresden.*** By John L. Eliot. Nov., 702-717
Dresden Royal Castle: Bombing damage 717
Dresden treasures (exhibit): National Gallery of Art 692, 700, 701, **701, 706-707**
Drought: Georgia 230, 235, 239; Pacific Northwest 197-198
Drougou, Styliani 57
Drummers: Japan 82, **82-85**
Druzes (Islamic sect) 332, 337, 339-340, **340**
Dubuffet, Jean: Sculptures by **697**
Duff, Tom 92; Vineyards 94
Duggan, Cindy 456, 459, 462
Dune system: Sand Hills, Nebr. 493, **494-495,** 499, 508; Dune types 508, "choppies" 508, 510, 517; Formation 499
Dunedin, South Island, New Zealand 248; Wool auction 257
Dürer, Albrecht 702, 713
Duroc (swine breed) **404**
Duruz, Jabal ad, Syria 337
Dutang, Paul 536
Dutch East India Company: Logo **567;** Ships: *Bantam* 566 *see also Witte Leeuw, outlined*
Dutch National Archives, The Hague: *Witte Leeuw* cargo manifest 566

E

Eakin Fruit Company, Yakima, Wash.: Apple processing 611
Earth: ***Voyager's Historic View of Earth and Moon.*** July, 53
East Germany *see* German Democratic Republic
East Indies: Trade routes to 562, 564, 566, 576
Eastalco Aluminum Company: Frederick, Md.: Casting ingots **196-197**
Eastcott, John: ***New Zealand's High Country.*** Aug., 246-265
Ebla (ancient city) 337, 340; ***Ebla: Splendor of an Unknown Empire.*** By Howard La Fay. Dec., 730-759
Calendar 750
Chronology 731, 733, 736, 737, 740, 741, 748, 750, 755, 759
Craftsmanship 735, **735, 738, 740,** 741, 752
Decline and obscurity of 731, 734, 748
Deities **740,** 745, 750, 755
Governmental districts 745
Intercity relations 740, 755 *see also* Mari; *and* Trade; Tribute; Wars, *below*
Kings 734, 735, 736, 740, 741, 743, 744-745, 750, 755 759; Elected 744, 755; Obligations 741, 744, 745
Language 731, 734, 748, 749, 759; Derivative languages 749; Name equivalents 736, 737
Map locating 734
Occupations 731, 735, 741, 745 *see also* Scribes
Population 741, 743
Structures 731, **738,** 740, 741; Depicted **744-745;** Palace 731, **737,** 740-741, **742-745**
Taxes 743, 759
Textiles 735
Trade 731, 734, 737, 759; Depicted **752-753**
Tribute received 735, 755
Wars 740, 741, 750, 755; Depicted **732-733**
World power (ancient Middle East) 731, 735, 740, 741, 744
Ebla tablets 340; ***Ebla: Splendor of an Unknown Empire.*** By Howard La Fay. Dec., 730-759
Accounting **730-731,** 748, 750, **758;** Depicted **751**
Age of 731, 748
Bilingualism 734, 748, 749; Semitic 731, 734, 748, 749, 759; Sumerian 734, 748, 749
Chronicles 735, 736, 745, 750; Military communiqué 740, 755
Chronology, may refute accepted 735, 736
Deciphering 734, 748, 749, **749**
Dictionary, bilingual 734, 749
Historical and archeological im-

portance 731, 735 *see also* Biblical studies; Chronology, *above*
Number of 731, 747; Significance of number 731, 733, 735
Personal names, significance of 733, 736, 737, 740, 745
Place-names 733, 734, 735, 736
Storage of (archive) 740-741, 746-747, **750-751,** 759
Ecology: Disruptions in: Grand Canyon 18, 22, 23, 27, 30; Ecological disaster *see* Oil spills
Ecosystems: Hot springs: Yellowstone National Park 845, 848
Ecuador *see* Galapagos Islands
Edessa, Greece 63
Edict of Nantes: Revoked 553
Edmondson, Betty L. **614**
Education: Home schooling 251, 254, 832; *see also* Schools
Edwards, Mike: ***Dream On, Vancouver.*** Oct., 467-491
Edwards Air Force Base, Calif.: Space Shuttle orbiter test flight **210-211**
Egypt: Postage stamp **798;** Relations with Syria 327, historical 330, 759
Egypt, ancient 731, 750, 759, 806; Boats 811, 812, 813; Pottery 759, 813, **816;** Trade routes 813
Eichman, Jacqueline **413**
Eiler, Terry and Lyntha: ***Yesterday Lingers on Lake Erie's Bass Islands.*** July, 86-101
Elamites 741
Elat, Israel 722, 728
Eldring, Leif 277, 278
Electricity: Aluminum industry 186, 189, 191, 193, 196-197, 204; Cost, retail 632; Transmission cables 186, **190-191,** 249; *see also* Hydroelectricity
Electrolysis: Aluminum smelting 193, 196, 198
Eliot, John L.: ***Treasures of Dresden.*** Nov., 702-717
Elliot Lake (town), Ontario: Uranium mine 781
Endangered and threatened species 23; Kaibab squirrel 41, 44; Squawfish 22
Energy sources: Nuclear power 577, 790-791; *see also* Coal; Electricity; Natural gas; Oil
England: Oil spill (1967) 108, 121; Smallpox: 17th century 797-798, 20th century 797, 800
English Channel: Oil spill (1978) 1, 107, 108, 120, ***Superspill: Black Day for Brittany.*** By Martin Rogers. July, 124-135
English East India Company: 1613 battle report 576
Enterprise (Space Shuttle orbiter): Test flight **210-211**
Environmental concerns 1; Palau's coral reefs 137; Svalbard, Norway 272, 282-283; *see also* Grand Canyon, Ariz.; Recycling
Environmental Protection Agency (EPA): Gasoline-consumption figures 203; Oil-spill expert, chief 118; Oil-spill research 120; Recycled materials, report on 211
Epitaph for a Killer? (smallpox). By Donald A. Henderson. Dec., 796-805
Equatorial Undercurrent, Pacific Ocean 371
Erie, Lake, Canada–U. S.: ***Yesterday Lingers on Lake Erie's Bass Islands.*** By Terry and Lyntha Eiler. July, 86-101
Eriksen, Bruce 476
Eritrea (province), Ethiopia 519, 520, 521, 523
Erosion processes *see* Grand Canyon, Ariz.
Espinosa Point, Fernandina (island), Galapagos Islands 377, 379
Esso Atlantic (ULCC): Capacity 115; Cut-away diagram **113-115;** Deadweight tons 113
Esso Pacific (ULCC) 113; Construction crew **116, 122-123;** Interior **116**
Ethiopia: Border changes (1897-1955): Maps 521; Border wars 519, 520, 521, 525, 798, 804; Smallpox-eradication campaign 797, 798, 804, health officer **796, 799**
Euler, Robert 28, 29, 40-41
Euphrates (river), Southwest Asia 353, 360, 815; Ancient civilizations 741, 755, 757, 806, 810, 812, 815; Confluence with Tigris 755, 806, **810-811,** 812, 815; Dam 327, **338,** 339, 353-354
Europe: Oil imports 107, 113, 115, 124; Smallpox eradication 798, 800
European wild boar 403, **404,** 411
Europort, Rotterdam, Netherlands 124
Evans, Betty, and daughter **510**
Exbrayat, Rosine **541**
Explorers: New World: Animal introduction: Churro sheep 434, 436, pigs 400; *see also* Arctic explorers
Extinct species: Rampart Cave, Ariz.: Fossils 17; *see also* Dinosaurs
Extraterrestrial life: Messages to 53

F

Fabre, Georges 560
Fagerstroem, Katja **772**
Faith healing: New Mexico 426, 432
Farias, Jesse 618
Farlow, James 176
Farmer-rancher wars: Sand Hills, Nebr. 512, 516
Farmers' strike: Georgia 230-231, **234**
Farms and farming *see* Agriculture
Faulkner, Douglas, photographer: ***Dazzling Corals of Palau.*** July, 136-150
Faylakah Island, Kuwait: *Tigris*'s near-mishap 814, 815
Fences, portable corral **514**
Ferries: Bass Islands, Ohio 86, **98;** Vancouver, British Columbia **466-467,** 468
Ferrone, Lucy Ann 773
Festivals: ***Day of the Rice God*** (Chiyoda, Japan). By H. Edward Kim. July, 78-85; Moxee Hop Festival 617-618; Muslim: Festival of Sacrifice 588; Theater: Ontario, Canada 789
Fido (pig) ***The Joy of Pigs.*** By Kent Britt. Sept., 398-415
Field day: Cherry County, Nebr., schools **496-497**
Fink, Alain 566, 569, 574
Firefighting: Aluminized asbestos suit **189;** South Island, New Zealand 251, 264
Fires: Grand Canyon, Ariz. 17
Fish runs: Reduced numbers 625, 628
Fisher, Allan C., Jr.: ***Where the River Shannon Flows.*** Nov., 652-679
Fishes: Batfish **372-373,** 377; Blenny **373;** Bream 652, 669, 674, 675; Bioluminescence: Ceratoid anglers 727, *see also Photoblepharon; outlined;* Grunts **364-366, 378-379;** Leaf fish **374-375;** Lionfish 727, 728; Oil pollution, killed by 124, 133; Red snapper **821;** Squawfish 22; Tench 669, **675;** Trout: Cutthroat 855, rainbow 22, **23,** 855; Walleye **785**
Fishing, commercial: Brittany, France: Oil-spill damage 124, 128, 132, 133; Georgia 240; Ireland 669, 672, 674, 676; Lake Erie 88, 92, 95, 99, catch **92;** Offshore harvesting, excessive 625, 628; Palau Islands 137; Vancouver, British Columbia 489; Yakima Indians 625, 630, seafood processing plant 625, 627, 630
Fishing, dipnet **628-629**
Fishing, sport: Ireland **675;** Lake Erie 86, 88, 90, 92, ice fishing 100, **100;** Ontario, Canada 784
Fishing rights: Yakima Indians 625
Fitzsimons, Sean 663
Flashlight Fish of the Red Sea (Photoblepharon). By Eugenie Clark. Nov., 719-728
Flathead National Forest, Mont. **294;** Mountain goat study 287, 296
Fleming, Jock 434
Fletcher, John 782
Flinn, H. C. 472
Float homes **474-475**
Florac, France 554, 555, **558,** 560
Floreana (island), Galapagos Islands: Marine life **364-366, 378-379**
Fodrea Community School, Columbus, Ind. **388-389**

Foege, Bill 804
Folk festival: Japan: ***Day of the Rice God***. By H. Edward Kim. July, 78-85
Forest products: British Columbia 468, **472-473,** 478, 487; Georgia **243;** Yakima Indian Nation, Wash. **618,** 627
Forney, Don and Olive, and family 507, 508
Forney ranch, Sheridan County, Nebr. 500, 507-508; Summer pasture **500-501,** 508
Fort George, Ontario: Reconstruction **792-793;** War of 1812 792-793
Fort Hope, Ontario: Indian village near 787
Fort Niagara, N. Y.: War of 1812 792-793
Fort Niobrara National Wildlife Refuge, Sand Hills, Nebr.: Cattle and bison auction 512, **512-513**
Fort William, Ontario: Reconstruction 788
Fossett's Circus: Limerick, Ireland **666**
Fossey, Dian 437
Fossil dating: Rock strata 644
Fossilization: Coyote bones **846**
Fossils: Color indications **644;** Grand Canyon 17, 45; *see also* Dinosaurs
Fotheringham, Allan 467
Foursin, Arsene 123-124
Fourth of July: Atlanta, Ga. **220, 221**
Fouts, Roger 461
Fouzilhac, France 544
Foynes, Ireland 672
France: Supertanker simulators **119,** 121; Truffle hunting 405, 408, **410;** *see also* Brittany; Cévennes
Franco, Tomas **417**
Franklin, Benjamin: Quoted 410
Franz Theodore Stone Laboratory, Gibraltar Island, Ohio 99
Fraser River, British Columbia **472-473,** 487, 489
Frauenkirche ruins, Dresden, East Germany 707
Frazer, James G.: Quoted 405
Frederick I, Holy Roman Emperor (Frederick Barbarossa): Death of 343
Frederick VII, King (Denmark): Helmet, aluminum and gold **198**
Frederick, Md.: Aluminum plant **196-197;** Recycling program 204
Fredonia, N. Y.: Natural-gas well, first 647, 649
French Marine Shell: Supertanker, world's largest 107, 123-124
French Somaliland, former 520; Maps 521
French Territory of the Afars and the Issas, former 519, 520
Frescoes, ancient Greek **54,** 55, 70, **72, 74,** 76
Fridman, David 720, 722, **723,** 726, 728
Frith, Doug 781
Frost emergencies: Fruit growing 615; Protection of trees: Ice coating **608, 612,** smudge pots **612, 613,** 615, wind machines 612
Fruit and fruit growing: Grape growing 92, 94, **94-95;** Pear growing **608, 613;** *see also* Apple growing, *outlined*
Fúgères, Albert du Lac de 541, **544**
Fuller, R. Steven: ***Winterkeeping in Yellowstone***. Dec., 829-857

G

Gabriel (archangel) 584, 589
Gainesville, Ga. 225-226
Galapagos Islands, Pacific Ocean: ***Undersea Wonders of the Galapagos***. By Gerard Wellington. Sept., 363-381
Galdikas-Brindamour, Biruté 437
Gangloff, Michel 566, 569
Garbage: Recycling projects 208, **208,** 209, 211
Garden, formal: Niagara Falls, Ontario **760-761**
Gardner, R. Allen and Beatrice 440-441, 449, 451
Gardy, Petro **485**
Garfield, James 44
Garrett, W. E.: ***Grand Canyon: Are We Loving It to Death?*** July, 16-51; photographer: ***Grand Canyon***. July, 2-15
Garrykennedy, Ireland: Fiddle maker 667, **673**
Gas: Synthetic 651, manufacturing proposed 634; *see also* Natural gas, *outlined*
Gastown (district), Vancouver, British Columbia 472, 475-476, **477,** 480
Gauls: Aegae, sack of 63-64, 70
Gaynor, Thomas and Michael 674, 679
Geer, Ernie 638-639
Gelb, Ignace J. 735
Gems: Dresden art objects 706, **708,** 710, **712-713**
Geology: ***The Grand Canyon***. July supplement; ***Grand Canyon: Are We Loving It to Death?*** By W. E. Garrett. July, 16-51; ***Natural Gas: The Search Goes On***. By Bryan Hodgson. Nov., 632-651
Geopressure zones: Natural gas 632, 635, 638-639, 641, 647, map locating 645-647, wells 635, 638, **638, 639**
George Bernard Shaw festival: Niagara-on-the-Lake, Ontario 789
Georgia, Lowell, photographer: ***Natural Gas: The Search Goes On***. Nov., 632-651
Georgia:
  Georgia, Unlimited. By Alice J. Hall. Aug., 202-245
  Agriculture 228, 229, **231, 238, 239**
  The arts 218, 222, 224
  Capital *see* Atlanta
  Civil War 218, 241; Reconstruction 224-225
  Coastal area **229,** 235, 239, **240-241,** 241, **242**
  Facts and figures 215
  Farmers' protest 230-231, **234**
  Flag **215**
  Governors 213, 214
  History, colonial 213, 215, 217, 224-225, 231, 239, 241
  Map 214-215
  Motion-picture filming 227-228
  Mountain region **236-237,** 241-242
  Piedmont region 215, 241
  Racial cooperation 214, 222
  Religion 214, 222, 244-245
  South Georgia 213, 216, **216-217,** 228-229, 230, 231, 235, 239, **240-241,** 241, **242-245**
  Trade, international 215, 242
  Urban renewal: Atlanta **212-213,** 214, 217, **218-219,** 220, 221, 222; Savannah 239, 241, **244-245**
  Wetlands, protected **228-229,** 235, 239
Kaolin 195, 201
Georgian Bay, Ontario 791, 794
German Democratic Republic (East Germany): Artworks 701, ***Treasures of Dresden***. By John L. Eliot. Nov., 702-717
Geysers: Yellowstone National Park 839, **844, 845,** corrosiveness of spray 839, ice nodule formation 839, **844,** wildlife, dangers to 839, **846**
Giants That Move the World's Oil: Superships. By Noel Grove. July, 102-124
Gibraltar (island), Ohio 86; Research station 99
Gilhooly, Vincent **660**
Glacier National Park, Mont.: Mountain goat study 284, 287
Glaciers: Svalbard, Norway 269, 277, 281, **282-283**
Glanzman, Louis S., artist: ***Ebla: Splendor of an Unknown Empire***. Dec., 730-759
Glen Canyon Dam, Ariz. 25, 44; Colorado River, altering of 20, 22, 23
Glen Lyon Station, South Island, New Zealand 254, **262-263**
Globtik Tokyo (ULCC) **111-112;** Deadweight tons 110; Paint, weight of 104
Glossbrenner (freighter): Woman deckhand **769**
Gloucester, Va.: Civil War era house **207**
Gluckauf (1886 prototype tanker): Diagram **115**
Glynn County, Ga.: Detention Center 235; Marshes of **229**
Goats *see* Mountain goats
Gobi Desert, Mongolia: Paleontological expeditions 164, 170-171

Goddard Space Flight Center, Md. 322
Godley Peaks Station, South Island, New Zealand: Sheep muster **252-253,** 258
Golan Heights, Syria: Israeli occupation 326, **357,** 360-361; Shelling from 357
Gold rush: South Island, New Zealand 264
Golden Horseshoe (megalopolis), Ontario, Canada 772, 776
Golding, Gordon 541, 555
Goldwater, Barry 24-25
Goldwork **198, 199, 708,** 710, **712-713, 716;** *see also* Macedonian tomb
Golf: Georgia **226-227,** 242
Good Friday rituals: Penitentes sect 431, 432
Goodall, Jane 437
Gordy, Frank 245
Gorillas: ***Conversations With a Gorilla.*** By Francine Patterson. Oct., 438-465; Fossey study 437
Gorsse, Louis 566, 569, 570
Gospel Conveyors (musicians) **219**
Goudet, France 541, **544**
Gough, Hugh 669, **675**
Goulet, Montagne du, France 548, 550, 557
Grain elevators: Ontario, Canada **788-791**
Grand Canyon, Ariz.:
The Grand Canyon. July supplement
Grand Canyon. By W. E. Garrett. July, 2-15
Grand Canyon: Are We Loving It to Death? By W. E. Garrett. July, 16-51
Archeology 28, 40; Finds **18-20, 39,** 40, 41
Climates 41, *supplement;* Pleistocene Epoch 41
Depths 16, 22, 23, 24, 29, 40, 45, 46
Deterioration of *see* Grand Canyon National Park, *outlined*
Erosion processes 23, 38, 40, 42, **42, 43,** *supplement;* Pinnacle formation 41-42
Exploration 32, 40, 41, 44, 51
Geology 23, 25, 32, 41-42, 45, *supplement;* Stratigraphy 25, **42, 43,** 45; Volcanism 23, 49
Indians: Pre-Columbian 29, 32, 38, 40, 41, relics **18-20, 39,** 40, 41; Present-day *see* Havasupai Indians
Length 16
Mapping of **36,** 37, **37**
Maps 32-34, *supplement*
Side canyons **8-10, 14-15, 25,** 29, 35, **50-51**
Side creeks **14-15, 42**
Storms 24, 25
Vegetation *supplement;* Exotic 22; Native 25, 41, 44
Wildlife *supplement;* Exotic 22, **23,** 27-28, 30, **31,** 38, damage from 22, 23, 27, 30, **30;** Imbalance, causes of 18, 27, 30; Native 18, **21,** 22, 27, 41, **44,** 51
see also Colorado River, *outlined;* Grand Canyon National Park, *outlined*
Grand Canyon National Park, Ariz.:
Grand Canyon. By W. E. Garrett. July, 2-15
Grand Canyon: Are We Loving It to Death? By W. E. Garrett. July, 16-51
Accommodations 24, 35
Assets, value of 28
Campsites 17-18, 29
Canyon crossing, means of 22, 33
Deterioration of 17, 18, **18-19,** 20, 24, 45; Burro damage 27, 30, **30;** Dam construction 20, 22, 23, 25; Ecological damage 17, 18, 20, 22, 23, 27, 30; Mule-trip damage 16, 29; Recommended counteraction 22, 24, 26-27, 35, 40, 46; River-trip damage 16, 17, 22; Visitors: Excessive number 17, 20, 22, 24, 29, 46, fires set by 17, waste generated by 22, 27, 46
Flights, sight-seeing 17, 41
Hikers 17, 20, **25,** 29, **29;** Casualties 17
Litigation 17, 26
Management *see* National Park Service, *outlined*
Maps 35, *supplement*
Mule trips **12,** 16, 28-29, *cover*
North Rim **2-3,** 16, 23, 41, 42, **48-49**
Park status, history of 18, 24-25; "wilderness" designation proposed 35
Public transit 24
River trips *see* Colorado River, *outlined*
Size 25; 1975 acquisition 25, 28, 35; Proposed additions 28, 35, 42, 44, map 35
South Rim **7-8,** 24, 29; Overdeveloped 20, 24, 36
Study of 22, 23, 26; Burro problem 24, 27
Trails **12,** 17, 20, 23-24, 28, 29, *cover;* Map 33-34; Mapping of **37**
Views, wide-range **2-15**
Visitors, annual number of 17, 22, 32
Grand Canyon of the Yellowstone River, Wyo. 829, 832
Grand Council of Treaty Number 9: President 782, 784, 787
Grande Randonnée (network of hiking tracks), Cévennes Mountains, France 540, 548, 560
Grange Lough, Ireland 663-664
Grantz, Arthur 650
Grape growing: Bass Islands, Ohio 92, 94, **94-95**
Graper, Bert 121, 123
Grasslands: Haud, Ethiopia 521; ***Land of Long Sunsets: Nebraska's Sand Hills.*** By John Madson. Oct., 493-517; Loss of: Arizona 44
Grave robbers 57, 70
Gravity map: Natural-gas prospecting 643
Gray, William O. 123
Grazing operations: Public domain 42, 44
Great Lakes *see* Erie, Lake
Great October Fair (horse fair), Ballinasloe, Ireland **662-665,** 676
Greaves, ancient Macedonian **61, 64-65,** 75-76
Greece *see* Vergina
Greek art, ancient: Vase painting **405;** *see also* Macedonian tomb
Greenfield Village, Dearborn, Mich.: Aluminum exhibit **205**
Grenoble, France: Supertanker simulators **119,** 121
Grizzly bears 832, 835, 839, 856; Assaults 832, 835, 838, 855; Management of 838; Protection against 832, **835;** Skull **835**
Groundwater: Georgia 215; Sand Hills, Nebr. 493, 498, 499
Grouse Mountain, British Columbia 468-469, **470-471**
Grove, Noel: ***Giants That Move the World's Oil: Supership.*** July, 102-124; ***Superspill: Black Day for Brittany.*** July, 124-135
Gruet, Dave 99
Grundig, Hans: Painting by **704-705**
Guda, Henri A. M. **194,** 201
Guinea: Postage stamp **798**
Guinness Brewery 656, 663
Gulf Coast: Natural gas 632, 635, 647
Gulf Oil 121; Supertankers 103-104
Guyana: Nationalization of aluminum industry 201
Guzman, José **429**

H

Haberman, Dave 92
Haerther, Daryl 410
Hagar (concubine of Abraham) 585, 588, 597
Hajj (Muslim pilgrimage) 329, 333; ***Pilgrimage to Mecca.*** By Muhammad Abdul-Rauf. Nov., 581-607
Accommodations 599, **602-603;** Tent cities **578-580,** 588, **598-599**
Animal sacrifices 585, 588, 601
Clothing 581, **582-583,** 583, 584
Commandment 581, 589
Epidemics, former 603
Pilgrims, number of (1977) 582
Restrictions 582, 583, 584, 588, 601
Rites 584-585, 588, 589, 592, **592-597,** 599, **600-601, 606-607;** Broadcast of 599

Season 587
Travel, various modes of 582-583, **584-585,** 588, **604-605,** 607
Hajji (title) 607
Halal, Muhammad 326
Hall, Alice J.: ***Georgia, Unlimited.*** Aug., 212-245
Hall, Charles Martin 196, 198
Hall-Héroult process: Discovery 196, 198
Hamah, Syria 346
Hamerstone, Jim 226-227
Hamilton, Lady Peggy **259**
Hamilton, Sir William 259
Hammond, Nicholas 63, 64
al-Hamoud, Najib **340**
Hampshire (swine breed) **404,** 414
Hancock, Warren 411
Hancock Laboratories, Anaheim, Calif.: Heart valves, "bioplasticized" **406,** 411
Handball court: Columbus, Ind. **396**
Hanke, Pete **630**
Hanke, Peter and Susan 611, 612, 615, **631**
Hanke orchard, Yakima Valley, Wash. 611, **612,** 615, 631
Hannon, Bruce 208
Harcourt, Michael 480
Harris, Curtis **233**
Harris, Robert: Drawing by **801**
Hartford Ballet **392**
Hartsfield, Roy 776
Hartt, Patrick 782
Harvard University: *Photoblepharon* studies 726-727
Hashimoto, Leonard 489
Hassan Gouled Aptidon 519, **525**
Hastings, J. Woodland 726-727, 728
Hats: Flower-hat costumes **78-79**
Haud grasslands: Ethiopian control 521
Havasu Canyon, Ariz. **14-15,** 29
Havasu Creek, Ariz. **14-15**
Havasupai Indians 29, 32; Land settlements 29, 35, map 35; Reservation **14-15,** 16, establishing of 29
Haversian canals: Dinosaur bones **182;** Human bones **182**
Hawthorne, G. David 221
Hayden Valley, Yellowstone National Park: Buffalo **836-837**
Hayes, Keith and Cathy 441
Hayre, Kartar Singh **485**
Hayward, Hazel **506**
Head, Sir Francis: Quoted 414
Heart valves, pig: "bioplasticized" **406,** 411
Hebrew culture: Eblaite influence 737, 740, 749, 754
Hebrew University laboratory, Elat, Israel: *Photoblepharon* studies 728
Heck, Ellen 411
Hedgepeth, William: Quoted 414
Hefner, Robert A., III 641, 648, **651**
Hegira (A.D. 622) 582
Heineman, Louis and Barbara 92, **94;** Vineyards 92
Heinz Steinitz Marine Biology Laboratory, Elat, Israel 722, 726
Helmets: Aluminum and gold **198;** Ancient Macedonian **61,** 72
Henderson, Donald A.: ***Smallpox—Epitaph for a Killer?*** Dec., 796-805
Henker, Klaus 711
Henson, Matthew 302
Herbert, Wally 302
Herman, Shellie **506**
Hermon, Mount, Syria 326, **357;** Sentry patrol **356**
Héroult, Paul L. T. 196, 198
Heterodontosaurus (dinosaur) **155, 165;** Skeleton, fossil **165**
Heuzey, Léon 62, 63
Heyerdahl, Thor: **Tigris *Sails Into the Past.*** Dec., 806-827
High Country Field Day: South Island, New Zealand 258
High-voltage power lines, aluminum 186, **190-191**
Hill, Robin 540
Hiller, Barbara 456
History, ancient *see* Civilizations, early
Hitchcock, Kathleen **619**
Hitchcock, Maurice **618, 619**
Hodgson, Bryan 577; ***Natural Gas: The Search Goes On.*** Nov., 632-651
Hog breeds 398, 400, **404;** Number of 413
Hogan, Hush 672
Hoge, Dianne and Ron **397**
Holland Marsh, Ontario: Farms 776, **778-779**
Holme, Norman 134
Holy Family Church, Chimayo, N. Mex. 416
Home schooling 251, 254, 832
Homesteaders: Sand Hills, Nebr. (pre-1910) 512, 516-517, war with ranchers 512, 516
Homs, Syria 346, 348
Honeymooners: Niagara Falls, Ontario 761, 765
Hop growing 617-618, **620-621;** Drying of cones **621**
Horlings, David 777
Horlings, Harry and Jane 776-777; Farm **778-779**
Hormel Institute of the University of Minnesota 412
Hormuz, Strait of 818, 824
Horn of Africa: Border changes 521, maps 521; Map 520; ***Smallpox—Epitaph for a Killer?*** By Donald A. Henderson. Dec. 796-805
Höroldt, Johann Gregorius 714
Horse fairs: Aurora, Ontario 772; Ballinasloe, Ireland **662-665,** 676
Horses 251, **255, 502, 772;** Appaloosas **232;** Ballinasloe **662-665,** 663; Extinct 17; Work horses 259, 493, 499, **501,** 508, **510, 514-515, 630**
Hot springs: Yellowstone National Park **833,** 839, **843,** 848, 851, algae 839, 845, 848, ecosystem 845, 848
Hotel complexes: Atlanta, Ga. **218-219,** 220; Saudi Arabia **602,** 603
Hotton, Nicholas 178
How Earth and Moon Look to a Space Voyager. July, 53
Hubert, Philippe 118
Hudaybiyah, Mosque of, Saudi Arabia 582
Hudson, W. H.: Quoted 414
Hudson Bay, Canada: Polar bears **783;** Tundra **784-785**
Hudson's Bay Company: Ontario, Canada 788
Hughie, Claudius **786**
Huguenots 557
Hull, Quebec, Canada 767
Humboldt Current (Peru Current), Pacific Ocean 371
Hunt, Alfred M. 197, 198
Hunters and hunting: Geese **786;** Mountain goats 295, 296; Svalbard, Norway 272, 279, 281
Huxley, Thomas Henry 164, 173
Huxtable, Ada Louise 685
Hyannis, Nebr.: Cafe **506**
Hyatt Regency (hotel), Atlanta, Ga. **218-219,** 220
Hydrates, methane 622, 647, 650-651; Map locating 645-647
Hydraulic fracturing (gas-recovery method) 637, 645, 648-649; Diagram **636-637**
Hydroelectricity: Ontario, Canada 789-790; River Shannon, Ireland 656, 657, 661, 669, 672; South Island, New Zealand 255, 263; United States 151, 191, 196-197
Hydrogen sulfide: Gas-well corrosion 641, 645, 651
Hypsilophodon (dinosaur) **156**

I

I. M. Pei and Partners, New York City 694
Ice Age: Grand Canyon animals 17, 41, 44; Ontario, Canada 784
Ice cover, induced: Fruit trees **608, 612**
Ice-cream parlor: Columbus, Ind. **394**
Ice skaters: Canada **767,** 768, hockey 776
'Id al-Adha (festival): Muzdalifah, Saudi Arabia 588
Idaho: Transmission tower **190**
Idlib, Syria 327, 341
Iguanas, marine **362-363,** 372, 377, 379; Swimming **381**
Iguanodon (dinosaur) **156-157;** Discovery 167
ihram (hajj restrictions) 582, 583, 584, 588, 601
Illinois Natural History Society: Powell Expedition (1869) 44
India: Smallpox 804
Indian lands: Havasupai–U. S. transactions (1975) 29, 35; On-

tario Indians: Present-day 782, 784, 787, Treaty Number 9 (1905) 782; Water rights 625; Yakima–U. S. transactions (1855, 1887) 624-625
Indian reservations: Grand Canyon region **14-15,** 16, 29, map 35; *see also* Yakima Indian Nation
Indian sign language **431**
Indiana *see* Columbus
Indians (Asian): Vancouver, British Columbia 482-483, 485, **485**
Indians of North America: Grand Canyon: Pre-Columbian 29, 32, 38, 40, 41, relics **18, 20, 39,** 40, 41; Ontario, Canada 782, 784, **786,** 787, **787,** 788; Sangre de Cristo region, N. Mex. 431, **431, 434;** Vancouver, British Columbia 480, **481,** 482; *see also* Havasupai Indians; Yakima Indian Nation
Indians of South America: Aymara Indians **808, 810-811,** 815
Indus River, Asia: Mohenjo Daro 823, 825
Indus Valley, Pakistan: History 817, 818, 823, 825; Natives **823;** Ruins **822-823,** 825; Sea links 806, 811, 813
Inflatable boom (barrier): Oil-spill containment **130**
Innes, Allan and Jessica 259, 264; Ranch 259
Innes, Pete and Janet, and family **250, 251,** 259, 264; Ranch **250, 251,** 259, 264, size 251
Innes, Sara 259, 264
Insect life: Thermal areas 845, 848
Inter-Lake Regatta: Bass Islands, Ohio 97
International Bauxite Association 194, 201
Iraq: Capital of Islam (A.D. 750) 335; Desertification 755, 757; Marsh Arabs **808-811,** 815; Relations with Syria 326, 327
Iraq, ancient 806, 813, 815, 818 *see also* Mesopotamian kingdoms
Ireland, Republic of *see* Shannon, River
Iron: Ancient Macedonian artifacts **61,** 63, 70, **71,** 72
Irrigation: Georgia 229-230; Sand Hills, Nebr.: Center-pivot systems 517; South Island, New Zealand 258; Syria 327, 332, 338-339, 346, 354; Yakima Valley, Wash.: Canals **609,** 610, Yakima Project 614
Irwin, W. G. 386
Is This the Tomb of Philip of Macedon? By Manolis Andronicos. July, 55-77
Isaac (son of Abraham): Sacrifice of, attempted 600
Ishmael (son of Abraham) 585, 589, 597; Sacrifice of, attempted 589, 600; Shrine built by 582, 585, 588, 589
Islam:
Iraq capital of (A.D. 750) 335
Pilgrimage to Mecca. By Muhammad Abdul-Rauf. Nov., 581-607
Almsgiving 589
Animal sacrifices 585, 588, 601
Calendar 585, 587, 588
Creed: Five Pillars of Islam 589
Equality 581-582, 583
Fasting 589
Hegira (A.D. 622) 582
Monotheism 582, 584, 585, 589
Pilgrimage *see* Hajj, *outlined*
Prayers **578-580,** 581, 584, 585, 589, 591, **592,** 603, 607
Prophets 589 *see also* Muhammad
Racial diversity 582
Sacred books 589, 595, 601
Shrines 584-585 *see also* Kaaba, *outlined*
World distribution: Map 587; Number of Muslims 587, 589
Syria Tests a New Stability. By Howard La Fay. Sept., 326-361
Island Airlines: Bass Islands, Ohio 90, Tin Goose 90, **91,** 92
Islands, coral reef **140-141;** Formation 140-141
Isle of St. George Vineyards, North Bass Island, Ohio 94, **94-95**
Israel: American aid 326; Druze enclave 337, 340; *see also* Arab-Israeli conflict
Issas (people) 519, 520, 523, **525**
Italian Archeological Mission in Syria *see* Tell Mardikh excavation
Ives, Joseph 32; Quoted 13
Ivory: Ancient Macedonian artifacts **56, 62,** 70, 72, 75, 76

J

Jackson, Henry **224**
Jackson, Maynard **219,** 222
Jackson, Valerie **219**
Jacobson, Leonard 700
Jamaica: Bauxite 194, 198, 200, 201, mines **194-195,** 198
James, Grover, family **238**
James Bay, St. Helena **564-565,** 566, 574; Bottom of 566, **567-569,** 569, 570
James Bay, San Salvador (island), Galapagos Islands 380
Japan: ***Day of the Rice God*** (Chiyoda festival). By H. Edward Kim. July, 78-85; Deep-water port **110-112;** Imports: Canadian 472, 490, Middle East oil 107, 117, 136, 137; Supertanker construction 107, 113, **116,** 122, crews **116, 122-123**
Japanese (people): Georgia **224,** 225, 227
Japanese-Canadians: Vancouver, British Columbia 489, internment (1942) 489-490
Japanese Current: Effect on Vancouver climate 468, 471
Jaramillo, Arturo 422
Jeffery, David: ***A Most Uncommon Town: Columbus, Indiana.*** Sept., 383-397
Jellison, Gail **97**
Jenner, Edward 798, 801
Jensen, James 164, **166,** 167, 171, **177**
Jensen, Marvin 17, 20
Jet Propulsion Laboratory, Pasadena, Calif.: Voyager spacecraft 53
Jidda, Saudi Arabia: Airport 581, 582, **582-583,** 599; Quarantine center 603
Jiddah (island), Bahrain: Limestone quarrying 817, 818
Jizi region, Wadi al, Oman: Copper mine, site of ancient **819,** 825, ruins **818,** 824-825
Job Service Center, Yakima, Wash. 618
Johannes, Robert 137
Johnson, Per 278-279, 281
Johnson, Philip 685
Johnson, Roy 22, 23, 26
Johnsons Bayou, La.: Natural-gas processing plant **641**
Jones, Bobby 227
Jones, Paul 632, 635, 639
Jones, Trinkle **18-19**
Josephine Ford (airplane) 302
The Joy of Pigs. By Kent Britt. Sept., 398-415
Junior Race Week: Bass Islands, Ohio **96**
Jupiter (planet): Exploration of 53

K

Kaaba (Muslim shrine), Mecca, Saudi Arabia: ***Pilgrimage to Mecca.*** By Muhammad Abdul-Rauf. Nov., 581-607
Aerial view **586**
Ceremonial washing 589, 592
Cleansed by Muhammad 584, 585, 588, 592
Cover, black cloth 584, 585, **593**
Door, annual opening 589, **593**
History: Builders 582, 584, 585, 587, 588, 589, 592
Prayers toward: Five times daily, 584, 587
Relic 585, **592**
Rites 584, 585, 588, 592, **597, 606-607**
Kachinski, John **100**
Kaibab National Forest, Ariz.: Cattle grazing suspended 42, 44
Kaibab squirrel 41, **44**
Kaiser Bauxite Company, Jamaica: Mines 198
Kalaji, Ahmad 361
Kanab Canyon, and region, Ariz. 35, 42, 44
Kändler, Johann Joachim 713-714
Kaolin: Aluminum in **195,** 201
Kaplan, Marion, photographer:

Djibouti, Tiny New Nation on Africa's Horn. Oct., 518-533; ***Smallpox—Epitaph for a Killer?*** Dec., 796-805
Kassab, Syria 341
Katholische Hofkirche, Dresden, East Germany: Organ 717; Restoration **704**, 717
Katz, Joseph 651
Keller Breland's Animal Behavior Enterprises, Hot Springs, Ark. 411
Kendall, Charles 576
Kennedy, Donnaca 663
Kenya: Smallpox-eradication campaign 797
Kerry Head, Ireland 674
Key, Lough, Ireland 661
Keylani, Majida 336
Khalid, King (Saudi Arabia) **592**
Kidd Creek mine, Timmins, Ontario 781
Kielan-Jaworowska, Zofia 164
Kiire, Japan: Supertanker port **110-112**
Killaloe, Ireland 656, 669, 672
Kilstiffin Bank, Ireland: Legend 679
Kim, H. Edward, photographer: ***Day of the Rice God*** (festival in Japan). July, 78-85
King, Martin Luther, Jr. 222
King John's Castle, Limerick, Ireland **677**
Kings Point, N. Y.: Supertanker simulator **118-119**, 121
Kirby, Ralph C. 200-201
Kirchner, Johann Gottlob 714
Kitchener, Ontario: Mennonites **774-775**
Kiyama, Manabu **224**
Klassen, Henry: Orchard **777**
Knights: Crusader orders 343-345; Saxon-knight exhibit: National Gallery of Art 700, **701**
Knobloch, Hilda 449
Koko (gorilla) 437; ***Conversations With a Gorilla.*** By Francine Patterson. Oct., 438-465
  Behavior 444, 452, 456, **457;** Lying 438, 458, 459, 461; Reactions to people 443
  Diet 453
  Intelligence 438, 440, 449, 454; Displacement 459
  Keyboard, auditory: Ability to use 453, **454-455,** 462, 464
  Personality 438, 440, 449
  Research funding 438, 451, 461
  Vocabulary development 438, 451, 453, 462, 464
  Weight 449, 452, 459, 462
Kolbu, Alf and Bjørg **276**
Kollock, John 237
Kon-Tiki (balsa-log raft) 811, 813
Kongsfjorden, Svalbard 283
Koran 589, 595, 601; Quoted 335
Krak des Chevaliers (crusader castle), Syria 344-345
Kreuzkirche, Dresden, East Germany 709, 717; Choir 714
Krüger, Wilhelm: Artwork by **708,** 710
Kuck, Lonn 296
Kurds (tribe): Syria 332, 333, 339
Kuteifan, Muhammad 335
Kwakiutl Indians: Carved house posts **481**

L

Labatt brewery, Toronto, Ontario: Toronto Blue Jays 776
Lacemaking: France 536, **541**
La Cienega, N. Mex.: Museum **417**
Lacrosse **480**
La Fay, Howard: ***Ebla: Splendor of an Unknown Empire.*** Dec., 730-759; ***Syria Tests a New Stability.*** Sept., 326-361
Lake Erie, Battle of 86, 98; Memorial 86, **91, 98**
Lake Erie's Bass Islands. By Terry and Lyntha Eiler. July, 86-101
Lake Hawea Station, South Island, New Zealand 247, 248, 257, 264; Garden **258**
Lakes, ancient: Grand Canyon region 23
Lamont-Doherty Geological Observatory 650-651
Lancaster, Henry 204
Land-claims transactions *see* Indian lands
Land grants, loss of: New Mexico 419, 422, 434, 436
Land of Long Sunsets: Nebraska's Sand Hills. By John Madson. Oct., 493-517
Lanesborough, Ireland 664
Langdon, Mary 17
Lange, James **223**
Langogne, France 542, 546
Languages: Ancient: Occitan 541, Semitic dialects 731, 734, 736, 737, 748, 749, 759, Western Aramaic 344, 349; *see also* Sign languages
Lansdowne House (village), Ontario 787
Lantern, ancient Macedonian bronze **60-61**
Larnax, ancient Macedonian gold **55, 59, 67-69,** 75, 76
Laser: Mapping, used in **34**
Latakia, Syria 341; Aerial view **342-343;** Orchards around 341
Laterite: Aluminum ore, possible 201
Lava Falls, Grand Canyon 16, 20, 22, 45, **49,** 51
Lava flows: Grand Canyon 23, **48-49**
La Vernède, France 555
Laxalt, Robert: ***New Mexico's Mountains of Mystery.*** Sept., 416-436
Lead: Recycling 204
Leakey, L. S. B. 437
Lebanon 332; Druze enclave 337; Syrian troops in 341
Lee, Art 478
Lee, Bernard 222
Lee, Bob 480
Lee, Douglas: ***Day of the Rice God*** (festival in Japan). July, 78-85
Lee, James 121
Lees Ferry, Ariz. **40,** 44, 45
Le Havre, France: Aerial view **872-873**
Lehmbruck, Wilhelm: Sculpture by **693**
Leland, Hazel **617**
Lemonade stand, child's: Put-in-Bay, Ohio **89**
Le Monastier, France 535; Lacemaking 536, **541;** Shoes, wooden **541;** Thatch roof **540-541**
L'Enfant, Pierre Charles 683, 688, 694
Leochares (ancient Greek sculptor) 75
Le Pont de Montvert, France: History 553, 554; River **558-559**
Le Puy, France 536, 539
Les Baux, France: Bauxite 192
Lew, Frank 478
Leyden, Ann **658**
Leyden, Matt **658, 659**
Liberal Party: Canada 478
Liberia: Supertanker registration 107, 109, 126, number 108
Life zones: ***The Grand Canyon.*** July supplement; Wheeler Peak, N. Mex. 419
Lightning rods: Washington Monument, Washington, D. C. **207**
Limerick, Ireland 656, 672, 676, **676-677;** Circus **666**
Limestone: Bahrain ruins **817,** 818; Grand Canyon strata **42,** 45
Limopsis (ULCC) 118
Limpets: Oil-smothered **131**
Linden, Eugene 462
Lions Gate Bridge, Vancouver, British Columbia **486**
Liquefied natural gas (LNG): Importation 633, price of 634, 641; Transport container **633**
Literature: Ancient Middle East 754, 757, 759
Little, Drewry 414
Littlehales, Bates, photographer: ***The Sunken Treasure of St. Helena.*** Oct., 562-576
Litton, Martin 44, **46**
Live trapping: Bears: Yellowstone National Park 838
Livestock *see* Cattle and cattle raising; Pigs; Sheep and sheep raising
Lobsters: Galapagos Islands 374, slipper lobster **374**
Locks: River Shannon, Ireland 656, 657, 661, 672
Locomotives: Abandoned: Svalbard, Norway **275;** Steam: *Royal Hudson* **469**
Log roof: "snail home" **781**
Log na Sionna (Shannon Pot), Ireland 652, 656, 657, 661
Long, Helen 224-225
Longhorn cattle 501, 512, **513**
Longyear, John Munro 269
Longyearbyen, Spitsbergen, Sval-

bard: ***Norway's Strategic Arctic Islands.*** By Gordon Young. Aug., 267-283
Loop Head, Ireland 679
Lord, Elver 514
Lord ranch, Cherry County, Nebr. **514**
Los Angeles, Calif.: Recycling program 204
Lough Derg Rally: River Shannon, Ireland 667
Louis IX, King (France): Crusade 343
Louis XIV, King (France): Protestant uprising against 553, 557
Louisiana: Natural gas: Geopressure test wells 635, 638, **638, 639,** pipelines **640, 641;** Single Point Mooring (SPM) port 118
Loyalists, United Empire: Ontario, Canada 773, 789
Lozère, Mont, France **536-537,** 548; Huguenot uprising 555; Stevenson quoted on 553
Luc, France: Castle ruins **546,** 547, statue atop **546,** 547
Lujan, Pat **417**
Lumber company: Yakima Indian Reservation **618**
Lungkwitz, East Germany 714
Luther, Martin 713

M

Maalin, Ali Maow 797, 804, **805**
McArdle, George 661
Macaulay, Lord Thomas Babington 797-798
MacBride, Daniel K. **87**
McCann, Mary **94**
McClish, Dick 649
McCormack, Paddy 656, 663, 664, 665
McCosker, John 728
Macdonald, Ian 794
McDonald, Jim 768
Macedonian tomb: ***Regal Treasures From a Macedonian Tomb.*** By Manolis Andronicos. July, 55-77
Antechamber 57, **59,** 67, 75-76
Artifacts: Bronze vessels and armor 57, **60-61, 64-65,** 73, 75; Gold objects **55,** 57, **59, 64, 65, 67, 68-69, 71,** 75, 76; Iron armor and weapons **61,** 70, **71,** 72; Ivory **56, 62,** 70, 72, 75, 76; Silver vessels 57, **61,** 72, **73,** 76
Dating 64, 65, 70, 76
Diagram 58; Cutaway painting **59**
Discovery of 57, 58, 65, 70, 72; Keystone entry 57, 70
Frescoes **54,** 70, **72, 74,** 76
Identification evidence: Dental dating 69; Diadem **57, 61,** 72, 76; Gold casket and quiver **57, 64, 65,** 75; Greaves, uneven 65, 76; Ivory likenesses **56, 62,** 75, 76; Sunburst emblem **55,** 76; Tomb date 70, 76
Inscription lacking 76
Sarcophagi 57, **66-67,** 72, 75, 76
Site 57, **58,** 64; Map 58
Skeletal remains 55, 67, **68-69,** 75, 76
McIver, Richard D. 651
McKee, Wayne 120
McKenzie, Arthur 109, 120
Mackenzie Basin, South Island, New Zealand: Hydroelectric project 255, chief engineer **263**
MacMillan Bloedel Ltd. 487
Macon, Ga. 215, 225, 245; Jewish delicatessen 245; Textile plant **224**
Madson, John: ***Land of Long Sunsets: Nebraska's Sand Hills.*** Oct., 493-517
Magan (ancient land) 811, 812, 818; Copper mine 825, remains **819,** 825
The Magic of Aluminum. By Thomas Y. Canby. Aug., 186-211
Magnesium: Aluminum alloy 193
Magnetic-field measurements: Natural-gas prospecting 642
Mahler, Charles ("Minnow Charlie") 86, 88, **92**
Malacca, Strait of 117; Draft limit 109; Shipping lanes 103, 124
The Mall, Washington, D. C. 683, **689-691,** 692; Drawing 688
Malula, Syria **344-345,** 349
Mammals: Dinosaurs replaced by 178, 185; *see also* Gorillas; Mountain goats; Pigs
Mandeville, Jamaica: Bauxite strip mine **194-195**
Manhattan (supertanker): Diagram **114-115;** Northwest Passage voyage 114
Mann, Kate 459
Manta ray 373, **376**
Mantell, Gideon, and wife 167
Manure: Methane produced from 651; Pleistocene sloth 17; Residue usages 651
Maori (tribe) 249, **251,** 264; Legend 255
Mapmaking 729; Grand Canyon, mapping of (1970-1977) **36,** 37, **37;** Subsurface, locating gas and oil 644
Maps:
Aegean region: Macedon, located 58
Africa: Horn of Africa 520, 521; Muslim populations 587; Route of *Witte Leeuw* around 564
Arctic region 268; Polar explorations 302-303
Asia: *Middle East* and *Early Civilizations in the Middle East.* Sept. supplement; Muslim populations 587
Atlantic Ocean: Balloon crossings: First successful (1978) 870-871; Unsuccessful (1873-1978) 870
Canada: *Close-up: Canada: Ontario.* Dec. supplement
Djibouti, Republic of 520
Erie, Lake: Bass Islands, Ohio, located 89
Europe, Eastern 704
France: Brittany (region): Oil spill (1978) 128; Cévennes (region): Donkey trek 538
Galapagos Islands, Ecuador 371
Georgia 214-215
Grand Canyon, Ariz. 32-34; *Grand Canyon,* July supplement
Grand Canyon National Park, Ariz. 35
Mediterranean region: *Eastern Mediterranean.* Sept. supplement
Middle East and Near East: Ancient 734, *Early Civilizations in the Middle East.* Sept. supplement; *Middle East.* Sept. supplement; Route of *Tigris* 812-813
Nebraska: Sand Hills region 498
New Zealand 249; South Island 248-249
Ontario 764; *Close-Up: Canada: Ontario.* Dec. supplement
Palau Islands, Caroline Islands, West Pacific Ocean 136
Red Sea: *Photoblepharon* study area 723
Sangre de Cristo (region), N. Mex. 424-425
Saudi Arabia: Mecca located 584; Muslim shrines 584-585
Shannon, River, Ireland 657
Spitsbergen (archipelago), Svalbard, Norway 268
Syria 332
United States: Natural-gas sources 645-647
Vancouver, British Columbia, Canada 468
World: Oil spills, major (1967-1978) 108-109; Smallpox eradication (1967-1978) 800; Supertanker routes and ports 108-109
Yakima Valley, Wash. 614
Yellowstone National Park, U. S. 830
Mar Sarkis, Monastery of, Syria 349
Marchena (island), Galapagos Islands: Marine life 376
Mardikh, Tell, Syria: Beehive houses **336-337;** Excavation site near 340
Mari (ancient kingdom) 353, 741; Ebla, links with 734, 740, 750, 755, 757; Excavation of 353, 750, 757; Kings 755, **756**
Marine biology: ***Undersea Wonders of the Galapagos.*** By Gerard Wellington. Sept., 363-381; *see also Photoblepharon*
Market, Lena 89-90
Markets: Cattle market **542-543;** Country store **230-231;** Farmers' market 228; Roadside vendor **231;** Suqs 333, **334,** 335, 340
Marlin Rockwell company: Gainesville, Ga. 225-227

Marr, Ray and Lou **395**
Marsh Arabs **808-811,** 815; Superstitions 810, 815
Marshall, Nancy 489
Marshes, protected: Georgia **228-229,** 235, 239
Martin, Dave 92
Martin, Jerry 667, **673**
Martinez, Eduardo **426**
Martinez, Joey 436
Martinez, Mae **428**
Martinez, Patricio 436
Marwah (hill), Mecca, Saudi Arabia 585, 588, 597
Mary Ann, Sister **795**
Masiyah, Tall al, Syria: Apocryphal Tomb of Jesus 339
Massachusetts: Dinosaur footprints, fossilized 162
Massie, Curt 100
Masters Golf Tournament: Augusta, Ga. **226-227,** 242
Masterwork on the Mall (National Gallery of Art). By J. Carter Brown. Nov., 680-701
Mathematics: Sumer 755
Mathias, Paul 648
Matisse, Henri: Cutouts by **692-693**
Matisse, Paul 701
Matthews, Charles 638
Matthiae, Paolo 731, 733, **739,** 740, 741, 759
Mauri, Carlo, photographer: **Tigris *Sails Into the Past.*** By Thor Heyerdahl. Dec., 806-827
Maybourn, Ralph 107
Mayer, John, II 400
Maynard, Leslie 126-127
Mazzoni, Stefania **737, 738**
Mead, Frank 235
Meakin, Howard 475-476
Mecca, Saudi Arabia: Pilgrimages 329, 333, ***Pilgrimage to Mecca.*** By Muhammad Abdul-Rauf. Nov., 581-607
Mecca Inter-Continental Hotel, Saudi Arabia **602;** Buffet **602-603;** Construction 603
Mechanicsville, Atlanta, Ga.: Art center 222
Medallion portraits: Philip II of Macedon **57,** wife **62**
Medicine and health: Research: Center for Disease Control, Atlanta, Ga. **223,** 798, 800, golden hamsters 340, pigs 400, **407,** 411-412; Technology: Pig-derivatives, uses of 406, **406,** 411; *see also* Diseases
Medicine Valley ranch, Yakima Valley, Wash. 627
Medina, Saudi Arabia: Founded 582; Pilgrimages 607
Mediterranean region: *Eastern Mediterranean.* Sept. supplement; *see also* Syria
Megalosaurus (dinosaur) **155;** Discovery 167
Meier's Wine Cellars, North Bass Island, Ohio: Vineyards 94, **94-95**
Meissen, East Germany: Porcelain **706-707,** 711, 713-714
Meissen Cathedral, Meissen, East Germany 713
Mellen, Ida M. 408, 410
Mellon, Andrew W. 683, 685, 688, 692, 694
Mellon, Paul 683, **688,** 694
Meltwater: Yakima Valley water supply 609-610; Yellowstone moss gardens 839, **845**
Meluhha (ancient land) 811, 812, 813, 823, 825
Melville, Herman: Quoted 371
Menghi, Umberto 483, 487
Menke, H. W. **170**
Mennonites: Ontario, Canada 774-775, **774-775**
Menzhausen, Ingelore 714
Menzhausen, Joachim 709-710, 713, 717
Merca, Somalia: Smallpox-eradication campaign: Last case 797, 804, **805**
Mercy, Mount of, Saudi Arabia: Pilgrims **594-595**
Merino (sheep breed): South Island, New Zealand **252-253,** 258, **260-261;** Wool from **257**
Mernin, Jerry 838
Merriman, and area, Nebr. 493, 498
Mesopotamian kingdoms 731, 733, 735, 736, 741, 748-749, 755, 757, 759, 806, 813; Ebla, interaction with 734, 755; Map 734; *see also* Akkad; Sumerians
Metals *see* Aluminum; Bronze; Copper; Goldwork; Iron; Silver
Methane: Coal-mine explosions 274, 283, 649; Coal seams 632, 645, 649; Cow manure, produced from 651; Formation 634
Methane hydrates 622, 647, 650-651; Map locating 645-647
Methanol: Methane recovery, used for 651
Metula (supertanker): Oil spill 108
Mexican immigrants, illegal: Yakima Valley work force 610, 623
Mexico: Farm-worker wages 623
Meyer, Grant 152
Miami, Fla.: Recycling program 204
Michael (gorilla) 440, 447, **450-452,** 453-454, 457, 461, 464-465
Middle Bass Island, Ohio 86, **99;** Winery 94-95
Middle East, ancient: ***Ebla: Splendor of an Unknown Empire.*** By Howard La Fay. Dec., 730-759; **Tigris *Sails Into the Past.*** By Thor Heyerdahl. Dec., 806-827; ***Tribes to Empires: The Growth of Civilization.*** Sept. supplement
Middle East and Near East 729; *Middle East.* Sept. supplement; Oil export 104, 107, 123, 137; **Tigris *Sails Into the Past.*** By Thor Heyerdahl. Dec., 806-827; *see also* Saudi Arabia; Syria
Middle Rock, Valdez Narrows, Alaska 118, 121
Middleton, Merlissie 222
Migrant workers 609, 610, **611,** 618-619, 623; Child labor 610, 623; Education 618, 619, 623; Itinerary, typical 619, 623; Wages 610, 618, 623
Milani, Tawfiq 349; Wife **347,** portrait **346**
Milinski, Heide 717
Miller, J. Irwin and Xenia **386**
Miller, Mark: ***Washington's Yakima Valley.*** Nov., 609-631
Mina, Saudi Arabia: Pilgrims **598-601, 604-605;** Stone pillars 585, 588, 599, **600, 601**
Mineral deposits: Calcium carbonate **14-15,** 16; Silica **845, 846**
Mines and mining: Bauxite: Jamaica 198, United States **194-195;** Copper: Oman, ancient 818, remains **819,** 825; Ontario, Canada 770-771, 777, 781; *see also* Coal
Ming Dynasty: Porcelain **563,** 568, 570, **571-573,** 574, **575,** 576
Mini-tankers: Grenoble, France **119,** 121
Mint growing: Yakima Valley, Wash. 610, 617
Mint-oil distilling 617
Mirabelli, Josephine **760**
Miró, Joan: Tapestry by **695**
Miserey, France: *Double Eagle II* (balloon) landing near **858-859,** 871, **876-879,** 881, 882; Golden Guest Book of Honor **881**
Mississippi Embayment, U. S.: Natural gas, possible 641
Mistral, Frédéric 541
Mitchell, Margaret 214, 224
Mitchell, Scott: House designed by **396-397**
Mobiles (Calder) 188, **680-681,** 683, **686-687,** 694, 698, 701
Mobley, George F., photographer: ***The Joy of Pigs.*** Sept., 398-415
Mobley, William H. 241
Modestine (donkey) *see* Donkey trek
Moffen (island), Svalbard, Norway 278, 279, 281, 282
Mohammed Abro Mohammed **522**
Mohenjo Daro (ancient city): Ruins **822-823,** 825; Seal from **823,** 825
Moir, James 765
Momatiuk, Yva: ***New Zealand's High Country.*** Aug., 246-265
Monaco Glacier, Svalbard, Norway 281
Monasteries: Ireland: Ruins 657, 667, **668,** 669; Monastery of Mar Sarkis, Syria 349; *see also* Trappist monasteries
Montana: Fossil sites 152, 158, **158-159,** 167; Wildlife *see* Mountain goats
Montoya, Candy 432
Moon: ***Voyager's Historic View of Earth and Moon.*** July, 53
Mooney, Paddy 664-665
Moore, Henry: Sculpture by **682, 684,** 694
Moose Factory (settlement), Ontario 782, 787

Mora, N. Mex. 434
Morin, James 726, 728
Moro, Oreg.: High-voltage power lines, aluminum **190-191**
Morris Brown College, Atlanta, Ga. 222
Moses (prophet) 589
Moslems *see* Muslims
Mosques: Saudi Arabia 582, 584, **584, 586,** 588-589, **590-591, 606-607;** Syria **331,** 335
A Most Uncommon Town: Columbus, Indiana. By J. Bruce Baumann. Sept., 383-397
Motion-picture filming: Georgia 227-228
Moullet, Jean François 132
Mounds: Aleppo (ancient city) **358-359, 736-737;** Bahrain **816-817;** *see also* Macedonian tomb; Tell Mardikh excavation
Mountain goats: Extinct 17; ***Mountain Goats: Daring Guardians of the Heights.*** By Douglas H. Chadwick. Aug., 284-296
Mourgues family 544
Moxee Hop Festival: Yakima Valley, Wash. 617-618
Muhammad (prophet) 333; Birthplace 584, 587; Death 588; Farewell sermon 585, 588, 595; Hegira (A.D. 622) 582; Islam revealed to 581, 584, 589; Tomb 607
Mule deer **21,** 30, 499, **504;** Population explosion (1906-1924) 18
Mule trips: Grand Canyon **12,** 16, 28-29, *cover,* trail damage 16, 29
Mullen, and area, Nebr. **510-511**
Mumford, Lewis 188
Murdoch, Larry, and family 254
Murmansk, U.S.S.R.: Strategic location 273, 276
Museums: Albertinum museum, Dresden, East Germany: Green Vault artwork 706, **708,** 710, **712-713,** curator 709-710, 713, 717; Musée de l'Armée, Paris, France: Aluminum and velvet coat **186-187;** Museum of Science, Boston, Mass.: Grand Canyon mapping expedition (1970-1977) **36,** 37, **37;** Rijksmuseum, Amsterdam, Netherlands: Ming porcelain **575,** 576; Zwinger, Dresden, East Germany 709, 711, 713-714; *see also* National Gallery of Art
Musical instruments: Japan **82-85;** Mandolin **516;** Organ (1753) 717; Violins and fiddles **509,** 667, **673,** aluminum **200**
Muslims: Abraham's migration, date given 731; Number of 587, 589, population percentages, map showing world's 587; *see also* Islam, *outlined*
mutawwifs (hajj guides) 584, **587**
Mutualism: *Photoblepharon* and light-emitting bacteria 719, 720, 722, 726
Muzdalifah, Saudi Arabia: Pilgrimages 585, 588
Mylar-aluminum blanket 186, **188-189**

N

Nadler, Hans 717
Nairobi, Kenya: Smallpox eradication 797
Napoleon I, Emperor (France) 566, 702
Napoleon III, Emperor (France) 62, 193, 198
Nash, Rod 18
Naskeena 4 (tugboat) 487
National Aeronautics and Space Administration 209; Voyager spacecraft 53
National Arts Centre, Ottawa, Ontario 768
National Association of Recycling Industries 203
National Capital Region, Ontario–Quebec 767
National Center for Resource Recovery, Washington, D. C. 209
National Farm Show, Washington, Iowa **408-409**
National Gallery of Art, Washington, D. C.:
Dresden exhibit 692, 700, **701, 706-707;** Number of artworks 701
East Building: ***The National Gallery's New Masterwork on the Mall.*** By J. Carter Brown. Nov., 680-701
Architect *see* Pei, I. M.
Artworks, number of 692
Benefactors 683, 688, **688,** 692, 694
Central court **680-681, 686-687,** 694, 700
Construction manager 694
Design **680-684,** 683, 685, **686-687,** 694, **695,** 698, **698,** 700; Diagrams 685
Exhibits, special *see* Dresden exhibit, *above*
Financing 683, 688
Library 688
Mobile **680-681,** 683, **686-687,** 694, 698, 701
Opening **682**
Paintings **692-693**
Planning consultant 694
Project architect 700
Sculptures **682, 693, 695-697, 699**
Skylight roof **680-681, 684,** 685, 694, **695-697,** 700; Light effects 683, 698; Movable 697, 698
Tapestry **695**
Educational activities 688, 692
Plaza 685
West Building 685, **691,** 692
NATIONAL GEOGRAPHIC (NGM):
Editorial research 151
Editorials 1, 151, 297, 437, 577, 729
National Geographic Society: Flag **297**
Grants: Gorilla communication 438, 451; Grand Canyon mapping (1970-1977) 37; Paleontology 164; Project Washoe 441; White gorilla 438; *Witte Leeuw,* search for 566
Mapmaking 729
Photos aboard Voyager 53
National Maritime Research Center, Kings Point, N. Y.: Supertanker simulator **118-119,** 121
National monuments 35; Perry's Victory and International Peace Memorial, Ohio 86, **91, 98**
National Park Service: Bear policy 838; ***Grand Canyon: Are We Loving It to Death?*** By W. E. Garrett. July, 16-51
Better-management studies 26
Pressure groups, dealing with: Appeasement 27-28, 30; Litigation 17, 26
Recreation-conservation dilemma 20, 26, 35; Recommended solutions 26-27, 35
Resource-management funds, lack of 28, 30
Staff 16, 17, **18-19,** 20, 22, 23-24, 26, **26,** 27-29, **30, 31,** 40-41; Inadequacy of 17, 20, 28, 30
National parks: Ecuador: Galapagos Islands 371, 380; France: National Park of the Cévennes 538, 555; Norway: Svalbard 273, 282; United States *see* Grand Canyon National Park, Yellowstone National Park
Natural gas 215, 577; ***Natural Gas: The Search Goes On.*** By Bryan Hodgson. Nov., 632-651
Consumption rate, U. S. 632
Energy uses 632
Flaring of 634, **634,** 635, **650**
Formation 634, 642; Generation temperatures 644
LNG *see* Liquefied natural gas
Pipelines 634, **640, 641;** Map 645-647
Processing plants 633, **641**
Prospecting methods **642-644;** Minimum-depth exploration 642, 647
Reserve estimates (1977) 632; Unconventional sources 632, 635, 641, 645, 647, 649, 650, map, U. S. 645-647
Sources *see* Coal seams; Deep basins; Devonian shales; Geopressure zones; Methane hydrates; "tight sands," western
Wells 635, 638, **638,** 639, **639,** 641, 648, **650,** 651; Depicted **637, 645, 647;** First in United States 647, 649
Natural resources *see* Aluminum; Energy sources
Nautilus, U.S.S. (nuclear submarine) 302
Nazir, Rashad Salim 821
Nebraska: ***Land of Long Sunsets: Nebraska's Sand Hills.*** By John Madson. Oct., 493-517

Nebuchadnezzar, King (Babylon) 757
Nechaev, Nikolai 278
Nepal: Smallpox 804
Netherlands: East India trade 562, 566; Supertanker port 124; *see also* Amsterdam
New Democratic Party: Canada 478, 782
New England: Oil spill 1, 108
A New Look at Dinosaurs. By John H. Ostrom. Aug., 152-185
New Mexico Highlands University, Las Vegas, N. Mex. 432, 434
New Mexico's Mountains of Mystery. By Robert Laxalt. Sept., 416-436
New York, N. Y.: World Trade Center **206**
New Zealand's High Country. By Yva Momatiuk and John Eastcott. Aug., 246-265
Newman, Larry: **Double Eagle II *Has Landed! Crossing the Atlantic by Balloon.*** Dec., 858-882
Newman, Sandy **872**
Newnan, Ga. 224-225
Niagara Falls, Canada-U. S. **761;** Hydroelectricity 196-197
Niagara Falls (city), Ontario 761; Formal garden **760-761;** Honeymooners 761, 765
Niagara-on-the-Lake, Ontario: Apple orchard **777;** Shaw festival 789
Niagara River valley, Canada-U. S. **792-793**
Nickel mine: Sudbury, Ontario **770-771,** 781
Nicol, Eric: Quoted 472
Nicomachus (ancient Greek artist) 70
Nigeria: Smallpox eradication 804
Nihon University, Tokyo: North Pole expedition 312, 315, 317, 319
Nimbus 6 (satellite) 316, 322, 324
Nippur (ancient city), Sumer: Court trial 757; Literature 757; Ruins 755, 757, excavation of 757, legal text found 757
Nobel Prize winners: Chemistry (1951) 211; Literature (1904) 541
Nobile, Umberto 302
Noguchi, Isamu: Sculpture by **695**
Norge (dirigible) 283, 302
Normandeau, Jim 627
North Bass Island, Ohio 86, 94, **99;** Vineyards 94, **94-95**
North Christian Church, Columbus, Ind. **391**
North Pole 267, 269; Explorers 268, 272, 279, 283, 297; ***Solo to the Pole.*** By Naomi Uemura. Sept., 298-325
Northover, Bill 623, 625, 627
Northrop, Barrie 487
Norway's Strategic Arctic Islands (Svalbard). By Gordon Young. Aug., 267-283
Nova Castella, João da 566
Nuclear power 577; Ontario, Canada 790, research 790-791
Nusayriyah, Jabal an, Syria 343
Ny Ålesund, Spitsbergen, Norway 268, **269,** 274, 282-283

O

Oakes Garden, Niagara Falls, Ontario **760-761**
Oates, Sir Thomas 566
O'Carolan, Turlough 661
Occitan (ancient language) 541
Oceania *see* New Zealand; Palau Islands
Ochsner, Dave 28, 44
O'Connor, Kevin 255
Oersted, Hans Christian 193
Offenbacher, Hurley 694
Ogaden (region), Ethiopia 521; Smallpox-eradication campaign 797, 798, **799,** 804, vaccine administered **802-803;** Somali invation 520, 523, 528, 798
Ogier, Rosalie **506**
Oglethorpe, James 239
Ohio: Shale-gas exploration 649-650; *see also* Bass Islands
Ohio State University research: Gibraltar Island, Lake Erie 86, 99
Oil: Formation 634, 642, generation temperatures 644; Glut 104, 121; Industrialized nations: Imports 107, 117-118, 137; Pipeline terminal: Alaska 104, 118; Production: Alaska 635; Prospecting methods **642-644;** Sediment depth 647; Svalbard, Norway 267, 274, 276; Syria 332, 346, 348, 353; Transport *see* Supertankers, *outlined;* Wells: Gas flaring 634, **634,** 635
Oil spills: Arctic region and 272-273, 276, 283; Coral reefs and 147; England (1967) 108, 121; France (1978) 1, 107, 108, 120, ***Superspill: Black Day for Brittany.*** By Martin Rogers. July, 124-135; Map (major spills 1967-1978) 108-109; United States (1976) 1, 108, 120-121
Oils: Mint oil 617
Okefenokee Swamp, Ga.–Fla. **228-229**
Oklahoma: Methane plant 651; Natural-gas production: Brine wells 638, deep-basin wells 641, 648, **650,** 651
Old Cienega Village Museum, La Cienega, N. Mex. **417**
Old Faithful, Yellowstone National Park: Snowmobile stop 856
Oldcoyote, Steve **622**
Olney, Leonard 630
Olympia, Greece 75
Olympias (wife of Philip II of Macedon) **62,** 67, 69, 75
"Olympics": Svalbard, Norway 278, **278, 279**
Oman 818, 824; Ancient land *see* Magan
Omni International Hotel complex, Atlanta, Ga. **219,** 220
Onakawana, Ontario: Coal mine 782
Oñate, Juan de 423
100 Years Later—Travels With a Donkey. By Carolyn Bennett Patterson. Oct., 535-561
One-room schoolhouses: Sand Hills, Nebr. 496, 507, School 100 **495-497**
O'Neill, Thomas: ***Dazzling Corals of Palau.*** July, 136-150
Onions, yellow: Harvest **778-779**
Ontario, Canada:
Great Cities, and Wilds Within Reach. Dec. supplement
Ontario: Canada's Keystone. By David S. Boyer. Dec., 760-795
Bilingualism 764, 767, 768, 773, 794
Economy 764, 771, 772, 777
Facts and figures 764
Farms and farming 776-777, **777-779;** Crops 776, 777, 788
Flag **764**
History 764, 765, 788, 792-793
Immigrants 762, 773
Indians 782, 784, **786,** 787, **787,** 788; Population 782
Lakes, number of 788
Maps 764, *supplement*
Mines and mining 770-771, **770-771,** 777, 781
Natural resources 764, 771, 777, 781, 782
Parks 782, 788
Ports 768, 788, **788-789**
Premier *see* Davis, William
Tourism 761, 765, 776, 784, 789
Ontario Hydro (power agency) 790
Orangutans: Galdikas-Brindamour study 437
O'Rear, Charles, photographer: ***Dream On, Vancouver.*** Oct., 467-491
O'Regan, Brendan 672
Ornitholestes (dinosaur) **156;** Skeleton 164, diagram **168**
Orontes River, Syria 346
Orpheum concert hall, Vancouver, British Columbia 491
Ortega, David 420-421
Ortega, Gabriel 421
Orwell, George: Quoted 414
Osbourne, Fanny Van de Grift 561
Ossabaw Island, Ga.: Pig study 403; Size 403
Ostrom, John H. **166;** ***A New Look at Dinosaurs.*** Aug., 152-185
Ottawa, Ontario 765, 767, 768; Ice skaters **767,** 768; International Festival of Music 767; Parliament Buildings **766,** 768
Ottawa River, Canada 765, 768; Nuclear research 790
Our Lady of the Snows (Trappist monastery), France 547-548; Monks **549, 551;** Silence, rule of 547, 548; Wine making 538, 548, 550
Owen, Sir Richard 167, 173

Owen, Robert 117
Oxen: France **552, 555;** Japan **81, 84-85**
Oyster beds, oil-spill damaged: Brittany, France 132

P

Paar, Elmer 623
Pace, Robert 623-624
Pacific islands *see* Galapagos Islands; New Zealand; Palau Islands
Pacific Power & Light Company: Transmission tower installation **190**
Paintings: Ancient Greek **54,** 55, 70, **72, 74,** 76, **405;** *see also* National Gallery of Art
Pakistan: Ancient civilization 817, 818, 823, 825, ruins **822-823,** 825; Smallpox 804
Palatitsia, Greece 62
Palau Islands, Pacific Ocean: ***Palau's Dazzling Corals.*** By Douglas Faulkner. July, 136-150; Supertanker port, proposed 117, 136, 137, 150
Paleontology: ***A New Look at Dinosaurs.*** By John H. Ostrom. Aug., 152-185
Palestine (region) 729; British withdrawal 326; Refugees: Syria 341, **342-343,** 343
Palestine, Tex.: Aluminum plant 198
Paliadelli, Chryssoula 57
Palmer Johnson Inc.: Aluminum yacht built by **202-203**
Palmyra (ancient city): Ruins 349, **350-351,** 353
Paper mill, world's largest: Georgia **243**
Park Hotel, Put-in-Bay, Ohio **88-89**
Parkland Memorial Hospital Burn Center, Dallas, Tex. **406,** 411
Parks, Sid 864
Parliament Buildings, Ottawa, Ontario **766,** 768
Parteen, Ireland: Fish hatchery 669
Pasamanick, Benjamin 449
Pasini, J., III 650
Pastres, Philippe de 123
Patterson, Carolyn Bennett: ***Travels With a Donkey—100 Years Later.*** Oct., 535-561
Patterson, Francine ("Penny") 437; ***Conversations With a Gorilla.*** Oct., 438-465
Pavelka, Phyllis **496, 497**
Peaches: Georgia 214, **231**
Peachtree Center Plaza Hotel, Atlanta, Ga. **213,** 220
Pear trees: Yakima Valley, Wash. **613,** blossoms, ice-coated **608**
Pearl Brewing Company, Tex.: Recycling, aluminum 204
Pearson, Lester 768
Peary, Robert E. 297, 302
Peat: Ireland 657, 664-665, **678-679**
Peccary 400; Collared **404**
Pei, I. M. 388, 683, 685, **688,** 692, 694, 698, 700; Buildings designed by 694, *see also* National Gallery of Art: East Building
Pella (ancient city), Macedon 62
Pelli, Cesar: Architectural design by **382**
Penitentes (religious sect) 418, 420, 425, 430, 431; Crucifixion rituals 418, 420, 432
Peppermint oil: Extraction of 617
Perch Lake, Ontario: Radioactive water 791
Périgord (region), France: Truffle hunting 405, 408, **410**
Permafrost: Methane hydrates 632, 647, 650; Svalbard, Norway 269, 274, 282
Permoser, Balthasar: Carving by **708,** 710
Perrault, Neil 487
Perry, Oliver Hazard 86, 89, 98; Quoted 86
Perry's Victory and International Peace Memorial, South Bass Island, Ohio 86, **91, 98**
Persephone (Greek goddess) **54,** 70
Persian Gulf: Ancient sea routes 813, port of call 816, 817, 818; Gas flares: Satellite image **634;** *Tigris* route 815-816, 818, map 813
Peru Current (Humboldt Current), Pacific Ocean 371
Petawawa River, Ontario 788
Peters, Arnold 782
Petroleum *see* Oil
Petroleum engineering: Depicted **642-643**
Petrone, Rocco 209
Pettinato, Giovanni 733, 735, 748, 749, **749,** 750, 755
Philip II (Macedon): ***Regal Treasures From a Macedonian Tomb.*** By Manolis Andronicos. July, 55-77
  Assassination 57, 62, 69, 76
  Burial site, possible *see* Macedonian tomb, *outlined*
  Empire 57, 62; Map 58
  Likenesses: Gold-and-ivory statue 75; Gold medallion portrait **57;** Ivory portrait **56**
  Personal characteristics 57, 62, 75; Lameness 57, 65, 76
  Reign 57, 62
  Son *see* Alexander the Great
  Wives 62; Cleopatra 67, 75, 76; Olympias **62,** 67, 69, 75
Philippeion (building), Olympia 75
Philoxenus of Eretria (ancient Greek artist) 70
Photoblepharon: Flashlight Fish of the Red Sea. By Eugenie Clark. Nov., 719-728
  Bacteria: Dependence on 726; Number of 719; Source of luminescence 719, 720, 722
  Behavior 720, 723, 725, 726-727, 728
  Breeding 723
  Communications, possible 720, 728
  Eye construction 720, 722; Blink rate 720, 727, 728; *see also* Photophores
  Grouping behavior 723, 726
  Habitat **718-719,** 720, **722-723,** 723; Artificial 726
  Light intensity **718-719,** 720, 722-723, 724, **726**
  Range 720, 723
  Size 719, 720, **723**
Photography, aerial stereographic: Map 37, *Grand Canyon.* July supplement
Photomicrographs: Sand **636**
Photomosaic map 37; *Grand Canyon.* July supplement
Photophores **719, 721, 723, 726-727;** Bacteria in 719, 722; Communication, possible means of 720, 728; Drawings of **720, 724-725;** Function 725, 726
Pictographs, ancient 748
Pierce, Sam 235
Pierce Arrow (car), 1925: Aluminum **205**
Pigeon skeleton: Diagram **168**
Pigs: ***The Joy of Pigs.*** By Kent Britt. Sept., 398-415
  As pets 398, 400, **401,** 414
  Behavior 400, 403, 405, 408, 409, 411, 414
  Birth of **402,** 403
  Diet 403, 405, 411, 412, 413
  Domestic hog breeds 398, 400, **404;** Number of 413
  History of 398, 400
  Intelligence 398, 400, 409, 414
  Marketing of 410, 411
  Medical uses of 406, **406-407,** 411, 412, 413
  "minipigs" 400, **401, 407,** 411, 412
  Nursing **402-403**
  Performing **398-399, 409**
  Physical characteristics 403, **404,** 405, 406, 408, 409, 411
  Pig farming 410, 411
  Reproduction 403, 411
  Research with 400, 403, 405, **407,** 411, 412-413, 414
  Sweat glands, minimal 408, 409
  Training of 398, 400, 408, 409, 411, 414
  Truffle hunters 405, 408, **410**
  Vocalizations 400, 414
  Weight 400, 403, 406, 412
  Wild swine 400, 403, **404,** 405, 412
Pigskin: Medical uses **406,** 411
Pilgrimage, Muslim *see* Hajj
Pine Ridge (region), Nebr. **500-501,** 508
Pioneer spacecraft: Venus probes 53
Pipelines: Natural gas 634, 636, **640, 641,** map 645-647; Oil: Alaska 114, terminal 104, 118
Pipers: Japan 82, **83**
Plains, Ga. 214, 216-217, **216-217**
Plaisted, Ralph 302
Planets: ***Voyager's Historic View of***

Earth and Moon. July, 53
Plankton 373, 377
Plate tectonics: Dinosaur extinction theory 182, 184
Plateosaurus (dinosaur) **155**
Player, Gary **227**
Playtank **383**
Plaza Abajo, Chimayo, N. Mex. 416, 423
Pleistocene Epoch: Grand Canyon animals 41, 44, fossils 17
Pliny the Elder (Roman writer) 70
Plutarch (Greek writer) 63
Pluto (Greek god) **54,** 70
Poland, Kingdom of: Map 704
Poland China (swine breed) **404**
Polar Bear Provincial Park, Ontario 782, 788
Polar bears 273, **280,** 297, 300, 304, 305; Jawbone **305;** Swimming **783**
Polcyn, Hank 100
Pollution: Aluminum plants 198; Svalbard, Norway **272,** danger of 272, 276; *see also* Water pollution
Polygamy: Arizona 41
Polyporus **478**
Pond, Harvell and Arlene, and family 618-619, 623, 631
Porcelain: Europe, first in 707, 711; Meissen, East Germany 711, 713-714; Ming **563,** 568, 570, **571-573,** 574, **575,** 576; National Gallery of Art: Dresden exhibit 701, **706-707**
Port Moody, British Columbia 469, 472
Port Revel, France: Supertanker simulators **119,** 121
Portman, John 217, 218, 220; Hotels designed by **218-219,** 220
Portrait of Planet Earth. July, 53
Ports: Busiest Pacific port of the Americas *see* Vancouver; Supertanker **110-112,** 118, 123, 124, construction of 110, 118, map 108-109, proposed 117, 136; World's largest: Europort, Rotterdam, Netherlands 124
Portsall, Brittany, France: Supertanker wreck near 108, **128-129,** oil-polluted harbor **132-133**
Portugal: East India trade 562, 564
Portuguese carracks 574; Dutch capture of 574; Naval battle 562, 563, **564-565,** 566
Pot, Shannon, Ireland 652, 656, 657, 661
Potrero, Chimayo, N. Mex.: Shrine 418, 425, 426, 432, **432**
Potrero Trading Post, Potrero, N. Mex. **418-419**
Potters, 16th- and 17th-century Chinese 570, 574, 576; Works of **563,** 568, **571-573,** 574, **575,** 576
Pottery: Ancient Egyptian 813, **816;** Ancient Macedonian 63, potsherds 70; Delft 570, 574; Eblaite **738,** shards **739;** Pre-Columbian Indians **19;** *see also* Porcelain
Poudevigne, M. and Mme 548
Poujol, Jacques 560
Powell, Cory **496, 497**
Powell, John Wesley 32, 44, 51; Quoted 8-10; Writings 44
Powell, Lake, Utah: Silting up 23
Power lines, high-voltage: Aluminum 186, **190-191**
Pradelles, France 542
Pre-Columbian civilization: Grand Canyon 29, 32, 38, 40, 41, relics **18-20, 39,** 40, 41
Premack, Ann and David 451
Presque Isle, Maine: *Double Eagle II* (balloon) launch site 859, **860**
Pribram, Karl 441
Price, Harvey 649
Primate studies 437, 441; Project Washoe 440-441, 449, 451, 461; *see also* Koko, *outlined*
Prince William Sound: Supertankers 118
Procompsognathus (dinosaur) **155**
Progressive Conservative Party: Canada 765, 782
Protestant uprising: France 553, 554, 557
Protoceratops (dinosaur) **156-157,** 164
Provincial parks: Ontario, Canada 782, 788
Prudhoe Bay, Alaska: Methane hydrate samples from 651
Pterosaurs 167, 168
Pueblo: Taos Pueblo, N. Mex. **430-431,** 434
Put-in-Bay, Ohio 86, **88-89,** 94, 99; Aerial view **90-91, 98-99;** House, steamboat-Gothic **86**
Pyramiden, Spitsbergen, Norway: Soviet community 271, 278
Pyrrhus, King (Epirus) 63

Q

Qabus, Sultan (Oman) 824
Qânâq, near Thule, Greenland 301, 305; Sled maker **300**
Queen Elizabeth Park, Vancouver, British Columbia **488-489**
Quick Start program: Georgia 225
Quiver, ancient Macedonian gold **64, 65,** 75
El Quneitra, Syria **357,** 360-361

R

Ra I (papyrus-reed ship) 811, 813, 826
Ra II (papyrus-reed ship) 808, 811, 813, 815, 826
Rabanne, Paco: Coat designed by **186-187**
Rabbit infestation: South Island, New Zealand 259
Rabun Gap-Nacoochee School, Ga. 242
Railroads: Canada 469, 472, 476, *Canadian* **790-791,** Chinese labor (1800's) 476, 485, Polar Bear Express **787,** *Royal Hudson* **469;** Djibouti **524-525;** Svalbard, Norway: Abandoned locomotive **275**
Rakaihautu (legendary Maori giant) 255
Rampart Cave, Grand Canyon: Fire damage 17
Ranches: ***Land of Long Sunsets: Nebraska's Sand Hills.*** By John Madson. Oct., 493-517; ***New Zealand's High Country.*** By Yva Momatiuk and John Eastcott. Aug., 246-264; Sangre de Cristo region, N. Mex. 419, 434, 436
Rancho de Chimayo (restaurant): Chimayo, N. Mex. 422
Randolph, Philip 635
Rangers, park: ***Grand Canyon: Are We Loving It to Death?*** By W. E. Garrett. July, 16-51; Yellowstone National Park 838, 848, 849
Ransom, Cathy 438
Ras Shamrah, Syria: Excavations 341
Rattle, baby's: Aluminum and gold **199**
Rattlesnake Hills, Wash. 611, **630-631**
Rau, Violet 627, 630
Ray, Dixy Lee **614**
Rays, manta 373, **376**
Raytheon Company: Metal separator **208**
Recycling: Aluminum 189, 193, 203-204, 208, **208,** 209, 211; Bronze 204; Copper 204; Garbage 208, **208,** 209, 211; Lead 204; Manure 651
Red Sea, and region: ***Flashlight Fish of the Red Sea (Photoblepharon).*** By Eugenie Clark. Nov., 719-728; *see also* Djibouti
Redgrave, Sir Michael 251
Redonda Rock (island), Galapagos Islands 376-377
Redwall Cavern, Grand Canyon, Ariz. 45, **46-47**
Ree, Lough, Ireland 665, 667
Reed houses: Iraq **809**
Reed ships 808, 811, 813, 815, 826 *see also* Tigris, *outlined*
Reeds *(bardi)* 815, 823, 825; Harvesting **808,** 815
Refugees: Ogaden-war refugees: Djibouti **528-529;** Palestinian: Syria 341, **342-343,** 343; United Empire Loyalists: Canada 773
Regal Treasures From a Macedonian Tomb. By Manolis Andronicos. July, 55-77
Regalado, Alfredo and Manuela, and family **611**
Reichel, Herta 706-707
Reindeer: Svalbard, Norway 272, 273, 283
Religions *see* Islam; Penitentes (sect); Shintoism
"Requiem" (Stevenson): Quoted 535; Tombstone inscription 561
Rescue: *Amoco Cadiz* crew 127
Resource-recovery plant: Ames, Iowa 209, 211

Restaurants, ethnic: Vancouver, British Columbia 483, **484,** 487
Reuther, Ronald 441, 449
Reynolds, David P. 203, 204
Reynolds Aluminum: Guyana 201; Recycling 204, 208
Rhea, Bart 436
Rhoades, Lisa, and niece **509**
Rhomaios, Konstantine A. 63
Rice, Bob 864, 865
Rice growing: ***Day of the Rice God*** (festival in Japan). By H. Edward Kim. July, 78-85
Richard I, King (England): Crusade 343
Richard, Henri **555**
Rickard, Andrew 782, 784, 787
Rickman, Frank 233, 242, 244
Ricqlès, Armand de 176
Riddle, John 222
Rideau Canal, Ontario 765, 768; Ice skaters **767,** 768
Riesling grapes 94
Riffey, John 16, 23-24, **26**
Riffey, Merribeth 16
Rio Grande, N. Mex. 418
River runners, professional: Grand Canyon 22, 23, 24, 44, **46, 47, 49,** conservationists 44, 46, park cleanup 46
Rivers and river trips *see* Colorado River; Euphrates; Shannon, River; Tigris River
Roca, Casimir 424, 426, 430-431, **432**
Rock paintings: Grand Canyon, Ariz. **18-19**
Rock strata: Fossil dating 644
Rocky Mountains, Canada-U. S.: Natural gas: Sandstone 632, 637, 645, 648-649; New Mexico: Range 418-419
Rodeos: New Mexico **428**
Rogers, Lesley 151
Rogers, Martin, photographer: ***Giants That Move the World's Oil: Supership.*** July, 102-124; ***Norway's Strategic Arctic Islands*** (Svalbard). Aug., 267-283; ***Superspill: Black Day for Brittany.*** July, 124-135
Roman Catholicism: Penitente sect 418, 420, 425, 430, 431
Roosevelt, Franklin D. 229
Roosevelt, Theodore 29; Quoted 2, 18
Roscoff, France: Oil pollution 130, battle against **130**
Rosenstein, Howard 728
Rosner, Daniel 176
Ross, Ireland: Cottage **678-679**
Roth, Elsie 510
Roth ranch, Cherry County, Nebr. **510-511**
Rotterdam, Netherlands: Shipyards 121; Supertanker port 123, 124
Round House Bar, Put-in-Bay, Ohio **88**
Roundups, cattle: Nebraska 493, **500-501,** 510-511; South Island, New Zealand 254
Rousakis, John **244**
Rowley, Jim and Fiona 247-249, **257, 258,** 264; Family 248-249, **256,** 264
Rowley, Tom and Adrienne, and family 249, **256,** 264
Royal Hudson (steam locomotive) **469**
Royal Ontario Museum, Toronto, Ontario: Dinosaur exhibit **152-154**
Roycroft, Noel 669
Royo, Josep: Tapestry woven by **695**
Rudolph, Roger and Nancy 848
Rukn ad-Din, Damascus, Syria **330-331**
Rumbaugh, Duane 451
Rural-urban migration: Georgia 229, 231, 233
Russell, Dale 182
Russell, Loris 178, 182, 184
Russell, Marjorie 624

S

Saadé, Gabriel 327
Saarinen, Eero: Buildings designed by **390, 391**
Saarinen, Eliel: Building designed by **385**
Sacred Mosque, Mecca, Saudi Arabia 584, **584, 586,** 588-589, **590-591, 606-607,** *cover;* Enlarging of 599; Gates 584, **590;** Interior **596-597;** Shrines: Zamzam, Well of 585, 588, 597, 607, **607;** *see also* Kaaba, *outlined*
Sacrifices: Animal: Bible 600, Arab workers' 810, 815, Koran 589, Muslim pilgrims' 585, 588, 601, of pigs **405;** Human, attempted 589, 600
Safa (hill), Mecca, Saudi Arabia 585, 588, 597
Safar, Fuad 813
Sagebrush: Yakima Valley desert, Wash. 609, 610, **630-631**
Sailing vessels: Aluminum 186, **202-203;** Thistle-class boats **96;** *see also Tigris; Witte Leeuw*
Sailing With the Supertankers. By Noel Grove. July, 102-124
St. Germain de Calberte, France: Camisards 560
St. Helena (island), South Atlantic Ocean: ***The Sunken Treasure of St. Helena.*** By Robert Sténuit. Oct., 562-576
St. Jean-Baptiste Day: Vankleek Hill, Ontario **794-795**
St. Jean du Gard, France 535, 538, 560, 561; Café **559;** Museums 553, 561
St. Lawrence River, Canada–U. S. 765
St. Lawrence Seaway, Canada–U. S. 768
St. Martin de Fugères, France 540-541
St. Pierre, Col de, Cévennes Mountains, France 535, 538, 560
Saladin, Sultan (Egypt and Syria): Army 344; Son of 358
Salmon **674;** Fishing: Ireland 669, 672, 674, 676, Vancouver, British Columbia 489, Yakima River **628-629**
Salt lake: Lake Assal, Djibouti **524**
Salvage, underwater *see Witte Leeuw*
Samis, Jim 651
Samoa Islands, Pacific Ocean: R. L. Stevenson 561
Sampans: Strait of Malacca 103, 104, 124
San Francisco Zoo 440, 441; Children's Zoo 449
San Gerónimo Mission, Taos Pueblo, N. Mex. **430-431**
San Miguel Mission, Santa Fe, N. Mex. **433**
Sand Hills (region), Nebr.: ***Land of Long Sunsets: Nebraska's Sand Hills.*** By John Madson. Oct., 493-517
Beef production 498, 517; Economics of 507-508
Dune system, characteristics of 493, **494-495,** 499, 508, 510, 517; Altitudes 508
Education: Quality of 497, 507, 508; Schools 496, 507, **509,** School 100 **495-497**
Farming attempts *see* Homesteaders, *below*
Formation of 499, 508
Grass cover 493, **494-497,** 499, **504,** 508, 511, **514,** 517
Highways and roads 493, 517
Homesteaders (pre-1910) 512, 516-517; War with ranchers 512, 516
Lakes 499, 504
Map 498
People 499, 505, 507, 510; Children, self-reliant 507; Retirees 507; Youth **506-507,** 507
Precipitation 499
Ranches: Map 498; *see also* Abbott ranch; Forney ranch; Lord ranch; Roth ranch
Settlement 508, 510, 511, 512, 516
Size 498, 499
Tourists, interests for 517
Water reserves 493, 498, 499
Wetlands 499; Man-made 508
Wildlife 499, **504,** 508; Refuges 512
Sanders, Howard 120
Sandstone: Grand Canyon strata **43,** 45; Natural-gas reserves 632, 634, 635, 648, located **645-647;** *see also* "tight sands"
Sandsvalen (freighter) 278-279, 281
Sangre de Cristo region, N. Mex: ***New Mexico's Mountains of Mystery.*** By Robert Laxalt. Sept., 416-436
Area 420
Indians 431, **431, 434**
Land grants 419, 422, 434, 436
Map 424-425
Name origin 418, 425

Population 420
Poverty 422, 426
Religion: Christmas ritual **422,** 423; Penitente sect 418, 420, 430-432; Shrine 419, 425, 426, 432
Schools 432, 434
Settlers 418, 419, 421, 423, 425
Spanish dialect 416, 418, 419, 425
Spanish heritage 416, 425, 434
Santa Fe, N. Mex. 416, 419-420, 425; Church **433;** Fiesta 431, 434
Santuario de Chimayo (shrine), Chimayo, N. Mex. 419, 425, 426, 432; Crucifix 425, 426, **432**
Sarcophagi, ancient Macedonian **66-67,** 72, 75, 76
Sargent, John Singer: Painting by **561**
Sargon, King (Akkad) 741, 748
"Satan's stoning points," Mina, Saudi Arabia 585, 588, 599, **600, 601**
Satellite communications: Colorado River 23; North Pole expedition 297, 316, 322, 324
Saturn: Exploration of 53
Saudi Arabia: Founding (1932) 591; ***Pilgrimage to Mecca.*** By Muhammad Abdul-Rauf. Nov., 581-607
Saunders, Ray 475, **477**
Savannah, Ga. 215, 239-241, **240-245**; Mayor **244**
Sawyer, G. M. ("Morie") 505, **516**
Saxon-knight exhibit: National Gallery of Art 700, **701**
Saxony, Duchy of: Map 704; Nobility: Weapons **710-711;** Protestantism 713; Rulers 702, 703, 709-710, armor of **703,** *see also* Augustus II, Augustus III
Saxony (region), East Germany: ***Treasures of Dresden.*** By John L. Eliot. Nov., 702-717
Scanlan, Michael 672, 674, 679
Scattery Island, Ireland 674
Scheib, Joe and Joy 264
Schill, Gerhard 709
Schneider, Sonny 95
Schools: Columbus, Ind. 386, **388-389;** One-room schoolhouses: Sand Hills, Nebr. **495-497,** 496, 507; Three-room log school: Ontario 787-788
Schreier, Peter 714
Schulz, Joachim 711
Schulz, Matthias, and son 717
Schwartz, Douglas 41
Schwoebel, Rich 864, 874
Scott, Bruce 255, 258
Scott, David W. 694
Scribes: Eblaite civilization 745, 748, 749-750, **751,** students 748, 749
Sculpture: Macedonian: Ivory portraits **56, 62,** 75; Middle Eastern **735, 738, 744, 754, 756;** Columbus, Ind. **382, 386, 393;** *see also* National Gallery of Art
Sea anemones **377**
Sea Bus ferry: Vancouver, British Columbia **466-467**
Sea lions **367-369,** 372, 373, 376, **379,** 380; Pups **378**
Seabirds: Oil-spill victims 134, **135;** Svalbard, Norway 282, **282-283**
Seaborg, Glenn T. 211
Seafaring, ancient: **Tigris *Sails Into the Past.*** By Thor Heyerdahl. Dec., 806-827
Seafood-processing plant: Yakima Indians 625, 627, 630
Seals (stamps), ancient **754, 806,** 816, **823,** 825
Seals, fur 373, 380
Sedimentation: Grand Canyon, Ariz. 40, 45
Seeking the Tomb of Philip of Macedon. By Manolis Andronicos. July, 55-77
Seismic prospecting 643, **643-644;** Methane hydrates 647, 650, 651
Semitic cultures, early: ***Ebla: Splendor of an Unknown Empire.*** By Howard La Fay. Dec., 730-759
Semper's Opera House, Dresden, East Germany 709
Senior Citizens Kitchen Band: Columbus, Ind. **384**
Senkevitch, Yuri 806, 815, 816, **820**
Sepia (tanker) 118
Seton, Ernest Thompson 837
Seven Years' War: Dresden, Germany 702
Seventy Islands Preserve, Palau Islands **140-141**
Shaban, Fuad 336
Shahba, Syria 339
Shakespeare festival: Stratford, Ontario 789
Shale: Fossils from **644;** Natural gas 632, 635, 647, 649-650, resources located **645-647**
Shannon Airport, Ireland: Duty-free shop 672
Shannon, River, Ireland: ***Where the River Shannon Flows.*** By Allan C. Fisher, Jr. Nov., 652-679
Boats and boating **653-655,** 656, 657, 661, 663, **666,** 667, 672, **676-677**
Castles **677;** Ruins 669
Fishing 669, 672, 674, **675,** 676
Hydroelectric power 656, 657, 661, 669, 672
Industry 656, 657, **660,** 672, 676
Legends 652, 661, 672, 679
Length 652, 656
Locks 656, 657, 661, 672
Loughs, major 658, 659, 661, 665, 666, 667
Map 657
Ruins 652, 657, 661, 664, 667, **668,** 669, 672
Source 652, 656, 657, 661
Tributaries **653,** 656, 661, 663, **675**
Shannon Pot, Ireland 652, 656, 657, 661
Shaqqa, Syria 339
Sharks 377, 380
Sharm el Sheikh, Sinai Peninsula 727
Sharon, Ga. **233**
Sharqi, Al Jabal ash, Lebanon–Syria 327; Malula **344-345,** 348-349; Mount Hermon 326, **357**
Shatt al Arab (river), Iraq 815
Shaw, George Bernard: Plays by 789
Shaw, Robert 224
Sheep and sheep raising: New Mexico **428-429,** decline in 434, 436; ***New Zealand's High Country.*** By Yva Momatiuk and John Eastcott. Aug., 246-265; Original American breed 434; Yakima Valley, Wash. **631**
Shell Oil Company: Natural gas geopressure zones 638
Shield, ancient Macedonian 61, 72, 73; Cover **60-61,** 73
Shilo, Moshe 722
Shintoism: ***Day of the Rice God*** (festival in Japan). By H. Edward Kim. July, 78-85
Shipbuilding: Japan 107, 113, **116,** 122, construction crews **116, 122-123**
Ships *see* Supertankers; *Tigris*
Shipwrecks: *Bantam* 566; *see also Amoco Cadiz; Witte Leeuw*
Shoes, wooden: France **541**
Shotover River, South Island, New Zealand 264
Shrines: Chimayo, N. Mex. 419, 425, 426, 432, **432;** Moslem: Zamzam, Well of, Mecca 585, 588, 597, 607, **607,** *see also* Kaaba, *outlined*
Siberia, U.S.S.R.: Methane-hydrate deposits 650, 651
Siegal, Fritz **200**
Sierra Club: Grand Canyon conservation 17, 25, 26, 29
Sign languages: Chimpanzee communication 438, 440-441, 461, 462; The deaf 438, 441; Gorilla communication 437, 438, 440, 451, **456, 461,** 462, "molding technique" **441,** 449; Indian **431**
Sikhs: Vancouver, British Columbia 482-483
Silbermann, Gottfried 717
Silt: Colorado River 16, 22, 23
Silver, ancient Macedonian 73, **73,** 76
Silver Swaddler (aluminized blanket) **188-189**
Simcoe, Lake, Ontario: Farms near 776, **778-779**
Sinclair Comparative Medicine Research Farm for the Study of Chronic Diseases and Aging, University of Missouri 412
Single Point Mooring ports 118
Sinyella, Wayne 29
Sioux Indian **622**
Skate (nuclear submarine) 302
Skid Road (district), Vancouver, British Columbia 476, 491
Skiing: Quebec, Canada 768; Sval-

bard, Norway **276,** 278; Vancouver, British Columbia 467, chair lift **470-471;** Yellowstone National Park 830, **831,** 839, 848, 849, 855
Skippers, South Island, New Zealand: Gold discovery 264
Skyscrapers: Atlanta, Ga. **212-213;** CN (Canadian National) Tower, Toronto, Ontario **762,** view from **762-763;** World Trade Center, New York, N. Y. **206**
Slag, nickel: Sudbury, Ontario **770-771**
Slavsk (freighter) 814, 815-816
Sled dogs 297; ***Solo to the Pole.*** By Naomi Uemura. Sept., 298-325
Sloan, Robert 178
Smallpox—Epitaph for a Killer? By Donald A. Henderson. Dec., 796-805
Asian strain 797, 800, 804
Contagion 797, 800, 803
Effects, long-term 801, 803
Laboratories, virus confined to 797, 800, 804; Located 800
Last cases: Laboratory contracted 797, 800; Natural 797, 804, **805**
Maps: Eradication (1967-1978) 800
Surveillance-containment strategy 800, 804
Symptoms **796,** 797, **798, 805**
Vaccine: Administration of **801, 802,** 803; Cowpox 798, 801; Freeze-drying 801; Storing 805
Smith, Dave 848, 849
Smith, David: Sculptures by **696-697**
Smith, Max 255, **263**
Smith, Ron 22, 23, 24
"snail home" (log cabin) **781**
Snowcoach (tractor) 830, 832, 849
Snowflake (gorilla) 438
Snowmobiles 269, 277, 287, 830, 832, 849, 856
Soitzek, Detlef **820**
Solar system: Exploration of 53
Solo to the Pole. By Naomi Uemura. Sept., 298-325
Somalia 519, 520, 521, 523; Dispute over Ogaden 520, 523, 528, 798, 804; Frontier **528-529;** Smallpox eradication 797, 804
Somalis (people) 520, 528, **532**
Sonny S. (fishing boat): Crew **92**
Soo-Hoo, Carroll 449
South Africa: Oil spill 108
South Bass Island, Ohio 86, **98-99;** Summer visitors 86, **97;** Vineyards 92, 94; Winter shore **101;** *see also* Put-in-Bay
South Equatorial Current, Pacific Ocean 371
South Island, New Zealand: ***New Zealand's High Country.*** By Yva Momatiuk and John Eastcott. Aug., 246-265
Cattle 248, 251, 254, 263
Character of people 246-247, 248, 259, 263, 264
Colonization 249, 259, 264
Discovery 249
Education 251, 254
Farms and farming 255, 259; Irrigation 255, 258, 263
Maori 249, **251,** 264; Legend 255
Map 248-249
Mountains 247, 249, 254, **265**
Sheep and sheep raising: Merinos **252-253,** 258, **260-261,** wool from **257;** Mustering 252, **252-253,** 258, **260-261;** Shearing **251,** wool **257,** 264
South Sea Islands *see* Palau Islands
Southcombe, Ann 453, 465
Southern Alps, South Island, New Zealand 247, 249, 254, **265**
Space Shuttle orbiter: Missions planned 53; Test flight **210-211**
Spacecraft *see* Voyager
Spanish (people): Grand Canyon 32, 44; Sangre de Cristo region, N. Mex. 418, 419, 423, 425
Spanish (language): Sangre de Cristo region, N. Mex. 416, 418, 419, 425
Spitsbergen, Svalbard, Norway: Fossil footprints 170; North Pole expeditions 302; ***Spitsbergen, Norway's Arctic Hot Spot.*** By Gordon Young. Aug., 267-283
Spivia, Ed 227
Splendor of an Unknown Empire: Ebla. By Howard La Fay. Dec., 730-759
The Splendor of Dresden: Five Centuries of Art Collecting (exhibit) 692, 700, **701, 706-707**
Spoke, Fred 490
Spoleto Festival (1962): Sculptures commissioned for **696-697**
Sponge, ancient **60,** 61
Squirrels: Grand Canyon species 41, **44;** Tracks in snow 839, **852**
Stamps, postage: Smallpox eradication campaign **798**
The "standing" (hajj rite) 585, 588, 595, **595**
Stanfield, James L., photographer: ***Ebla: Splendor of an Unknown Empire.*** Dec., 730-759; ***Syria Tests a New Stability.*** Sept., 326-361
Stanford University, Calif.: Campus **452, 457;** Gorilla-communication research 438, 440, 453, 462
Stanley Park, Vancouver, British Columbia 468, **478, 479,** 489
Stanolind Oil and Gas Company: Tulsa, Okla 639
Starfish **374**
Starkey, Roy 23
Startling New Look at Dinosaurs. By John H. Ostrom. Aug., 152-185
Steam clock: Vancouver, British Columbia 475, **477**
Steamboat-Gothic house: Put-in-Bay, Ohio **86**
Steel: Armor **702-703;** Sculptures **696-697, 699**
Stegner, Wallace: Quoted 14-15
Stegosaurus (dinosaur) **155-156, 183;** Back plates 176, 182; Infant skeleton 172; Tail spikes 182, **183**
Steinhart Aquarium, San Francisco, Calif. 728
Sténuit, Robert **575;** ***The Sunken Treasure of St. Helena.*** Oct., 562-576
Stevens, Sam 241, 242
Stevenson, Fanny Osbourne 561
Stevenson, Robert Louis: ***Travels With a Donkey—100 Years Later.*** By Carolyn Bennett Patterson. Oct., 535-561
Death 561
Donkey trek: Distance 535, 538; Route 535; Route retraced, map of 538
Portraits **535, 561**
Sketches by **541, 545, 553**
Works by 561; "Requiem" quoted 535, 561; *see also Travels with a Donkey in the Cévennes*
Stevenson Centenary Committee 538
Steveston, British Columbia 489-490
Stewart, Edward **765**
Stitt, Merle 17, 20
Stockton, Stan 28, 29, **31**
Store Norske Spitsbergen Kulkompani 267, 269
Strategic Spitsbergen (Svalbard, Norway). By Gordon Young. Aug., 267-283
Stratford, Ontario: Shakespeare festival 789; G. B. Shaw plays 789
Street, Daisy Mae 231, 235
Strip mines: Jamaica **194-195,** 198
Struthiomimids: Endothermy, possible 178; Posture 174; *see also Struthiomimus*
Struthiomimus (dinosaur) **157,** 171, **174-175;** Skeleton **174**
Stump, Bob 20
Subsurface mapping: Locations of gas and oil 644
Sudbury, Ontario: Nickel mining 781, slag **770-771**
Suez Canal: Supertankers and 107, 108
Sugar, James A., photographer: ***The National Gallery's New Masterwork on the Mall.*** Nov., 680-701
Sugar beets: Syria 339, 346, 354
Sugarhead, Daisy 787, 788
Suhar, Oman: Ruins near **818,** 824-825
Suidae family (pigs) **404**
Sumanik, Ken 296
Sumer (ancient kingdom): Civilization, world's first known 748, 812
Sumerians 748; Mathematics 755; Seafarers: **Tigris *Sails Into the Past.*** By Thor Heyerdahl. Dec., 806-827; Writing 734, 748, 749
Summer Beaver (village), Ontario 787, 788

Sun: Polar orbiter planned 53
Sunburst symbol, ancient Macedonian **55, 67,** 75, 76
The Sunken Treasure of St. Helena (Witte Leeuw). By Robert Sténuit. Oct., 562-576
Sunshine (fishing boat) 489
"super well" (natural gas) 641, **650**
Supernovas: Dinosaur-extinction theory 182, 185
"Supersaurus" 167, 171, 172, 176; Weight 171, 176
Superships *see* Supertankers
Superspill: Black Day for Brittany. By Martin Rogers. July, 124-135
Supertankers 1, 812, 818, 824, 825
Giants That Move the World's Oil: Superships. By Noel Grove. July, 102-124
Amenities 107, 109, 117
Construction 107, 113, **116,** 122; Crews **116, 122-123**
Crews **106, 107,** 109, 117, 123; Costs 109; Sizes 107
Cut-away diagram **113-115**
Deadweight tons 104, 107, 110, 113, 114, 118, 120, 123
Drafts 104, 109, 118, 123
Future of 121, 123
Largest 107, 123-124
Navigational aids 103, **104, 106,** 117
Number of 104
Oil spills 107, 117, 120-121; Map 108-109
Owners 107, 108, **110**
Ports **110-112,** 118, 123, 124; Construction of 110, 118; Map 108-109
Registration 107, 109; Map 108-109
Routes: Map 108-109
Safety devices 117, 121, 123-124
Simulators **118-119,** 121
Sizes 103-104, 107, 113-115, 123 *see also* Deadweight tons, *above*
Ports, proposed: Palau Islands 117, 136, 137, 150
see also Amoco Cadiz
Suppes, Patrick 462
Suqs: Syria 333, **334,** 335, 340
Suzuki, Toru **820**
Svalbard, Norway: ***Norway's Strategic Arctic Islands.*** By Gordon Young. Aug., 267-283
Area 267, 269
Barometric pressure 269, 283
Coal 267, 268; Mines 268, 269, 272, explosions 274, 283; Processing plant **272**
Consul, Soviet 278
Governor *see* Eldring, Leif
History 267, 268, 269, 271, 272, 273, 283
Map 268
Midnight sun 276-277
Name origin 267
Natural resources 267, 272-273, 274, 282 *see also* Coal, *above*
Norwegian sovereignty 268, 271, 272, 274
Recreation 272, 277-278, **278-279;** Sports **276,** 278
Soviets in 268, 271, **271,** 272, 273, 278, **278-279**
Strategic location 267, 268, 269, 273-274, 276, 282
Tourism 278
Transportation 269, **269,** 271, 272-273, 277
Treaty of Svalbard (1925) 268, 272, 274, 276
Wildlife 272, 273, 278, 279, **280,** 281, 282-283, **282-283**
Winter darkness **266-267,** 267, 269, **272**
Sveagruva, Spitsbergen, Norway 269
Swapp, Preston 42, 44
Swimming pools: Supertankers 107, 109
Swine breeds **404**
Swords, ancient Macedonian 70, 72
Symbiosis: *Photoblepharon* and light-emitting bacteria 719, 720, 722, 726
Syria Tests a New Stability. By Howard La Fay. Sept., 326-361
Ancient 329, 330, 333, 337, 339, 340, 341, 344, 349, 350-351, 353, 358 *see also* Ebla
Arab-Israeli conflict 326, 327, 341, 343, 357, 360; Effects of 348, **357,** 360; Palestinian refugees 341, **342-343,** 343
Archeological sites 337, 340, 341, **350-351,** 353
Bazaars 333, **334,** 335, 340
Capital *see* Damascus
Christians 329, 335, 341, 343, 344, 348-349
Desert 353, **354-355**
Education 329, **329,** 333, 335-336; Schoolchildren **328, 345**
Facts and figures 332
Farms and farming 327, 338-339, 341, **348-349, 352,** 353; Granary **336-337;** *see also* Irrigation, *below*
Flag 332
History 326, 329, 330, 333, 339, 341, 343, 344-345, 346, 349, 350-351, 353; Early civilizations, site of 327, 358 *see also* Archeological sites, *above;* French rule 340; Republic 326, 327; *see also* Arab-Israeli conflict, *above*
Houses, beehive **336-337**
Irrigation 327, 332, 338-339, 346, 354
Map 332
President *see* al-Assad, Hafez
Religion *see* Christians, *above;* Islam
Soviet aid 327, 329, 333, 338, 341, 353
Tribes 332, 333; Bedouin 353, **354-355;** Druzes 337, 339-340, **340;** Kurds 339
Women 329, **329,** 333, 336-337, 339, **347, 352,** 353, **355;** Bride price 340

T

T-2 tankers: Deadweight tons 104, 115; Diagram **114-115**
Ta Tchen Tcheung **485**
Taboos: Eating of pork 405
Talone, Ed 649
Tampa, Fla.: Aluminum recycling center near 208
Tank farm: Kiire, Japan **110-112**
Tankers *see* Supertankers
Taos, N. Mex. 420, 434; Art colony 420, 431; Sheep raising near **428-429**
Taos Pueblo, N. Mex. **430-431,** 434
Tarbosaurus (dinosaur) **156-157**
Tarn River, France 553, **558-559;** Stevenson quoted on 558
Tartus, Syria 341; Cathedral 345-346
Tasman, Abel 249
Tavernier, Michel 566
tawaf (hajj rite) 584, 585, 588, 592, **597, 606-607**
Taylor, Jim 436
Tell Mardikh (town), Syria 741; Beehive houses **336-337**
Tell Mardikh excavation 340; ***Ebla: Splendor of an Unknown Empire.*** By Howard La Fay. Dec., 730-759
Temple, Jerry 209, 211
Tenacious (yacht) **202-203**
Tenontosaurus (dinosaur) 162
Terrell, Vera and Beecher 29, **29**
Tesch, Harold **399**
Texas: Fossil footprints, dinosaur 162
Texas drovers: Sand Hills, Nebr., settlement 511, 512
Textile-printing plant: Macon, Ga. **224**
Thanksgiving Day: Canada 773
Al Thawra, Syria 339
Thecodonts 166
Thedford, Nebr.: High school: Student fiddler **509**
Therapsids 166
Thermal areas *see* Yellowstone National Park
Theropods: ***A New Look at Dinosaurs.*** By John H. Ostrom. Aug., 152-185
Thomond Bridge, Limerick, Ireland **676**
Thompson, Carl 176
Thompson, Jay **428**
Thompson, Ken 118, 120
Thomson, Richard M. 773
Thor Heyerdahl Sails in the Wake of Sumerian Voyagers. By Thor Heyerdahl. Dec., 806-827
Thunder Bay (city), Ontario 788; Grain elevators **788-791;** Port 788, **788-789**
Tiber Creek-bed, Washington, D. C. 700
Tibni, Syria: Cotton farming near **352**

Tierra Amarilla, N. Mex.: 1967 shoot-out 422
Tiffany's (store), New York, N. Y.: Aluminum capstone displayed 196, 207
Tifton, Ga. 215; Crops **239**
"tight sands", western: Natural gas 632, 645, 648; Fracturing 645, 648, diagram **636-637;** Located **645-647**
Tigre Lagoon, La.: Natural gas: Geopressure test well 635
Tigris (reed ship): **Tigris *Sails Into the Past.*** By Thor Heyerdahl. Dec., 806-827
Burning of 826, **827**
Construction of **808, 810-811,** 815
Crew 812, 815, **820, 821, 826-827**
Dedication of **810**
Draft 818
End of voyage 813, 826, **826-827**
Hazards 806, 812, 814, 815; Oil tankers 812, 818, 824, 825
Hull, twin 806, **807, 810-811, 814,** 815, 825
Length of voyage 813, 815, 826
Repairs **814**
Route: Map 812-813
Sails **807,** 815, **824**
Tigris River, Iraq–Turkey 759, 815; Ancient civilizations 735, 755, 806, 812; Confluence with the Euphrates 755, 806, **810-811,** 812, 815
Tijerina, Reies 422
Tikkoo, Ravi **110**
Tilmissan, Adeeb 584
Timber: British Columbia 468, **472-473,** 478, 487; Georgia **243;** Yakima Indian Nation, Wash. **618,** 627
Timmins, Ontario: Mines 781
Tinguely, Jean: Sculpture by **382**
Tipton, John 390
Tocher, Jim 648
Tombs: Tomb of Jesus, apocryphal 339; *see also* Macedonian tomb
Toppenish, Wash. 626, 627
Toronto, Ontario: The arts 772, 776; Immigrants 762, 773; Population 764, 772; Tower **762,** view from **762-763**
Toronto Blue Jays (professional baseball team) 776
Torosaurus (dinosaur) **157**
Torrey Canyon (supertanker): Oil spill 108, 121, 124, 134
Total Victory Over Smallpox? By Donald A. Henderson. Dec., 796-805
Totus, Watson 627
Tower, world's tallest free-standing: CN (Canadian National) Tower, Toronto, Ontario **762;** View from **762-763**
Tower Gallery, National Gallery of Art, Washington, D. C.: Matisse cutouts **692-693**
Tracks, animal: Fossil footprints 162, 170; In snow 839, **852, 853**
Trade routes: Ancient Middle East 731, 734, 737, 759, **Tigris *Sails Into the Past.*** By Thor Heyerdahl. Dec., 806-827; East India 562, 564, 566, 576
Trampas, N. Mex. 422
Transatlantic balloon flights: Attempts (1873-1978) 864, 870-871; Successful *see Double Eagle II*
Transco Companies Inc.: Houston, Tex. 639
Transcontinental Gas Pipe Line Corporation: Louisiana: Pipelines **640, 641,** processing plant **641**
Transmission tower, aluminum: Installation by helicopter **190**
Trapping, live: Bears 838
Trappist monasteries: France 547-548, monks **549, 551,** wine making 538, 548, 550; Number of 548
Travels With a Donkey—100 Years Later. By Carolyn Bennett Patterson. Oct., 535-561
Travels with a Donkey in the Cévennes (Stevenson) 535; Frontispiece **534;** Quoted 535-561; Trip statistics 535, 538
Treasure, sunken *see Witte Leeuw*
Treasures of Dresden. By John L. Eliot. Nov., 702-717
Treaty Number 9 (1905): Ontario Indians 782
Treaty of Svalbard 268, 272, 274, 276
Trees: Cedars, western red **479;** Chestnut 554-555; Cottonwood 29; Hemlock 487, polyporus on **478;** Mini-trees **777;** Ponderosa pine 41, 44
"Tres Horas" (crucifixion reenactment) 432
Triceratops (dinosaur) **157, 163, 184-185**
Trillmich, Fritz 373
Trolleys, electric: Yakima Valley, Wash. **617,** conductor and riders **616**
Truchas, N. Mex. **420-421,** 422, 431
Trudeau, Pierre Elliott 768, 773, 794
Truffle hunting: Dogs 408, 410; Pigs 405, 408, **410**
Trujillo, Evonne **431**
Tsavdaroglou, Spyros, photographer: ***Regal Treasures From a Macedonian Tomb.*** July, 55-77
Tumbleson, Myron E. (Mike) 412, 413, 414
Tundra: Ontario, Canada 764, **784-785;** Svalbard, Norway 277, 282-283; Wheeler Peak, N. Mex. 419
Turc, Mme 555
Turner, Ted 203
Turner, Thomas **208**
Twizel, South Island, New Zealand 255, **263**
Tyrannosaurus (dinosaur) **156-157,** 158, **162-163,** *cover;* Hunting method 162; Size 162, 171

U

ULCC's *see* Ultra Large Crude Carriers
Udall, Morris 25
Uemura, Naomi 297, **297,** *cover;* ***Solo to the Pole.*** Sept., 298-325
Ugarit (ancient city): Alphabet 341, **754;** Artwork **754;** Eblaite influence 740, 749, 754; Excavations of 341, 741, 749, 754; Literature 754
Ultra Large Crude Carriers (ULCC's) 107, **111-112,** 117, 118, **122-123,** 123-124; Defined 107; Diagram **113-115;** Draft 118, 123
Umayyad Mosque, Damascus, Syria **331,** 335
Uncompahgre Plateau, Colo.: Fossil sites 167, 171, **177**
Undersea Wonders of the Galapagos. By Gerard Wellington. Sept., 363-381
Union Camp: Georgia: World's largest paper mill **243**
Union of Soviet Socialist Republics: Foreign relations: Democratic Yemen 520, Ethiopia 520, Somalia 520, Syria 327, 329, 333, 338, 341, 353, *see also* Svalbard; Methane-hydrate deposits 650, methane recovery 651; Smallpox: Fight against 803, laboratory 800
United Arab Republic 327
United Nations: Smallpox-eradication campaign: Medal commemorating **797,** postage stamp **798**
United Nations Trust Territory, Pacific Ocean *see* Palau Islands
United States: Aluminum production 196, 197; Foreign relations: Canada 773, Israel 326; Hops production 618; Hydroelectricity 191, 196-197, first large-scale plant 196; Imports: Bauxite 200-201, oil 107, 117-118; Indian affairs 29, 35, 624-625; ***Natural Gas: The Search Goes On.*** By Bryan Hodgson. Nov., 632-651; Oil spill (1976) 1, 108, 120-121; Smallpox, fight against 803; Supertanker port, construction of 110, 118; Supertanker registration 107, 109, number 108; *see also* National Park Service, *and* U. S. entries, *following*
U. S. Bureau of Mines: Aluminum research 151, **195,** 201; Assistant director 200-201; Coal-seam degassing 649; Recycling **208**
U. S. Bureau of Reclamation 625
U. S. Capitol, Washington, D. C. **684, 698**
U. S. Coast Guard: Valdez Narrows, Alaska 118
U. S. Department of Energy: Natural gas: Geopressure test wells

635, **639,** proposed wells 639; Technology center 649, 650
U. S. Department of Labor: Employment center funded by 618
U. S. Forest Service 42, 434, 436
U. S. Geological Survey: Natural-gas studies 635, 650; Satellite communications 23
U. S. Immigration and Naturalization Service: Mexican immigrants, illegal 623
University of British Columbia Museum of Anthropology **481**
University of California at Los Angeles: *Photoblepharon* studies 726
University of Missouri: Sinclair Comparative Medicine and Research Farm for the Study of Chronic Diseases and Aging 412
Upper Canada Village (reconstruction), near Morrisburg, Ontario 789
Ur of the Chaldees, Mesopotamia 736, 741, 755, 759
Uranium: Ontario, Canada 781
Uranus: Exploration of 53
Urban renewal: Atlanta, Ga. **212-213,** 214, 217, **218-219,** 220, 221, 222; Savannah, Ga. 239, 241, **244-245;** Vancouver, British Columbia 480, **482-483**
Urbanization: Ancient Middle East 735, 740, 741, 743
Usakowsky, Igor 816
Utah: Aluminum ores 195, 201

V

VLCC's *see* Very Large Crude Carriers
Vaccines *see* Smallpox
Vaea, Mont, Western Samoa: R. L. Stevenson's grave 561
Valdez, Facundo 434
Valdez Narrows, Alaska: Supertankers in 1, **105,** 118, simulation 121
Valentine, and area, Nebr. **494-495,** 499, 505, **512-513, 516-517,** 517
Valves, heart: "bioplasticized" **406,** 411
Van de Putte-Latham, Mme Léon 560-561
Van Horn, John 505
Van Horne, William Cornelius 469, 472
Van Valen, Leigh 178
Van Winkle, Jim 499
Vancouver, George 468, 472
Vancouver, British Columbia, Canada: ***Dream On, Vancouver.*** By Mike Edwards. Oct., 467-491
Area 482
Climate 467, 468-469, 471, 480
Commuter transit 468, **490-491;** Ferries **466-467,** 468; Float planes 468, **474,** 487
Economic boom (1950's and '60's) 480
Ethnic diversity 478, 480, 482-483, 484, 485, **485,** 489-490; Discrimination 483; Restaurants 483, **484,** 487
Fishing industry 489
Forest-products industry 468, **472-473,** 478, 487
Map 468
Mayor *see* Volrich, Jack
Parks 468, **478, 479, 488-489,** 489
Population 468, 476; Decreasing 482
Port, busiest American Pacific **466-467,** 467-468, **470-471,** 472, 490
Railroad terminus 469, 472, 476; Steam locomotive **469**
Renovation 475-476, **477,** 480, **482-483**
Skiing 467; Chair lift **470-471**
Steam clock 475, **477**
Symphony orchestra 490-491
Urban planning 480, 482
Vankleek Hill, Ontario: Nun **795**
Varming, Henrik 269
Vase painting, Greek: Ritual slaughter **405**
Vegetable garden, moss-supported 781
Velociraptor (dinosaur) **156,** 164
Venoil (supertanker): Oil spill 108
Venpet (supertanker): Oil spill 108
Venus: Exploration of 53
Vergina, Greece: ***Regal Treasures From a Macedonian Tomb.*** By Manolis Andronicos. July, 55-77
Vermeer, Jan 702; Painting by **715**
Vermejo Park, N. Mex. 436; Rodeo **428**
Verolme Shipyards, Rotterdam, Netherlands 121
Very Large Crude Carriers (VLCC's) 103-104, 107, 108, 109, 117, 120, 124; Defined 107; Draft 104, 118; Simulators **119,** 121
Vesey, Arthur 789
Victoria, Queen (Great Britain): Ottawa, founding of 765, 768
Victory, Hotel, South Bass Island, Ohio 90
Vigil, José Antonio 423
Vigil, Norberto 423
Vigil family 422-423
Viki (chimpanzee) 441
Villanueva, N. Mex. 426, **427**
Vineyards: Bass Islands, Ohio 92, 94, **94-95**
Violins: Aluminum **200;** Violin maker 667, **673**
Volcanism: Grand Canyon 23, 49
Volrich, Jack 480, 482
Voltri sculptures **696-697**
Von Eckardt, Wolf 685
Voyager spacecraft: Voyager 1: ***Voyager's Historic View of Earth and Moon.*** July, 53; Voyager 2: Flybys 53
Vulcans Throne, Grand Canyon, Ariz. 23, **48**

W

Wagner, Tommy **231**
Waitaki Catchment Commission, South Island, New Zealand 259
al-Walid II, Caliph (Damascus) 335
Waller, Michael 638
Walruses 272, 278, 279, 281
Walters, Jim 27, 28, **30**
Wan Li, Emperor (China) 574
War of 1812: Battle of Lake Erie 86, 89, 98; Niagara River valley, Canada–U. S. 792-793
Wardwell, Ed 569
Warfare: Ancients, as practiced by **732-733,** 740, 741, 755; Gallic 63-64, 70; Macedonian 62, 75; *see also* Crusaders
Warm Springs, Ga. 229
Warthog **404**
Washburn, Barbara **36**
Washburn, Bradford **36,** 37
Washington: ***Washington's Yakima Valley.*** By Mark Miller. Nov., 609-631
Washington, D. C.: Suburb **401;** *see also* National Gallery of Art
Washington Building Congress: Awards 700
Washington Monument, Washington, D. C.: Aluminum capstone 193, 196, **207**
Washoe (chimpanzee) 440-441, 449, 451, 461
Water pollution: Lake Erie 90, 92, 95, 99; Mercury: Hudson Bay area lakes 784; *see also* Oil spills
Water reserves: Georgia 215; Sand Hills, Nebr. 493, 498, 499
Water-rights legislation: Indian lands 625
Water Street, Vancouver, British Columbia 475, **477**
Watson, Tom **226**
Wattenberg gas field, Colo. 648; Sand fracturing **637**
Weapons: Ancient Macedonian 57, 63, 72; Saxon firearms **710-711**
Weaver, Kenneth F. 577
Weaving, John **653,** 656
Wedding party: Niagara Falls, Ontario **760-761**
Weems, Bill, photographer: ***Georgia, Unlimited.*** Aug., 212-245
Weese, Harry: Church designed by **390**
Welder: Supertanker construction **116**
Weller, Mr. and Mrs. Frank, Jr. 398
Wellington, Gerard **370;** ***Undersea Wonders of the Galapagos.*** Sept., 363-381
Wellman, Walter 268
Wells, natural-gas *see* Natural gas
Wenman (island), Galapagos Islands 379-380
West African nations: Measles-smallpox program 798
Westcott, Bridget **769**

Wetlands: Georgia **228-229,** 235, 239; Nebraska 499, man-made 508
Whales: Galapagos Islands 373
Wheat: Loading of freighter **788-789**
Wheeler Peak, N. Mex. 418-419
Where the River Shannon Flows. By Allan C. Fisher, Jr. Nov., 652-679
White Swan, Wash.: Mint distillery 617
White Swan Lumber Company: Yakima Indian Reservation, Wash. **618**
White-water trips: Grand Canyon **5-6,** 45, **49,** 51; Petawawa River, Ontario 788
Whitewater Lake, Ontario: Settler **780, 781**
Whitlow, Vicki **220**
Wieland, Denton 635
Wild pigs 400, 403, **404,** 405, 412
Wilderness area, proposed: Grand Canyon National Park, Ariz. 35
Wildlife: Sand Hills, Nebr. 499, **504,** 508; *see also* Grand Canyon; Mountain goats; Svalbard, Norway; Yellowstone National Park
Wildlife preserves and refuges: Sand Hills, Nebr. 512, longhorn cattle auction **512-513;** Svalbard, Norway 272, 273, 282
Wilds, Clara **384**
Wiley, W. C. ("Doc") 864, 874
Williams, Elizabeth 627
Williams, Sinclair 782
Williamson, Ron and Jennifer 251, 254; Family 251, 254, **255**
Wiltshire, Julian 540
Wimer, Jack **616, 617**
Windmill **510**
Wine making: Bass Islands, Ohio 90, 92, 94-95; Trappist monks: France 538, 548, 550
Winterkeeping in Yellowstone. By R. Steven Fuller. Dec., 829-857
Bear assaults 832, 835, 838, 855; Protection from 832, **835**
Christmas season 849
Education of childern 832, 855
Housing **830,** 832, **854**
Isolation 829, 832
Mail service 849
Recreation **834, 835, 842-843,** 848, **855**
Snow-cornice removal **828-829,** 832, 848
Supply storage 832
Winterkill, animal: Yellowstone National Park 839, 846, 856
Witte Leeuw (Dutch East Indiaman): ***The Sunken Treasure of St. Helena.*** By Robert Sténuit. Oct., 562-576
Battle, naval 562, 563, **564-565,** 566, 570, 576
Cannons **567,** 569, 570, 574, 576
Cargo 566, **568, 569,** 574, 576; Diamonds 563, 566, 568, 574, 576; Pottery 563, 576, Ming porcelain **563,** 568, 570, **571-573,** 574, **575,** 576; Spices 563, 566, 568, 570, pepper 568, 570, 574
Hull remnants **568-569,** 570
Route 562, 576; Map 564; Return 564, 566, 576
Search for 564, 566, 575, 576; Divers 566, **567, 568,** 569, 570, 574; Equipment **567, 568,** 569-570, 574, 576
Stern: Explosion of **564,** 568, 576; Missing 574, 576
Wittmer, Rolf 379
Wolf Fork Valley, Ga. **236-237**
Women: Deckhand **769;** Fisherwoman 489; Governor **614;** Mayor **614;** Pilot **619;** Primate studies 437; Ranch hands **510, 511**
Wood carvings: Eblaite **735;** Indian **481**
Woodcock, John and Ellen 787
Wooden shoes: France **541**
Woodruff, Robert W. **225**
Woods Hole Oceanographic Institution: Oil-spill research 120-121
Woolfitt, Adam, photographer: ***Where the River Shannon Flows.*** Nov., 652-679
Working Cowboys Rodeo: Vermejo Park, N. Mex. **428**
World Health Organization (WHO): Diseases eradicated 603, smallpox campaign 797, 798, 803, 804, 805; Headquarters 798, located 800
World Trade Center, New York, N. Y. **206**
World War II: Dresden, bombing of 702, 704, 706, 717, death toll 709; France 560; Greece: Effects on archeological sites 63; Svalbard, Norway 273; Tankers 115; U-boats, German 186, 200; Vancouver, British Columbia: Japanese-Canadians, internment of 489-490
World's Worst Spill (oil). By Martin Rogers. July, 124-135
Wreaths, golden: Ancient Macedonian **68-69,** 75
Wright Flyer: Aluminum use 211
Writing: ***Ebla: Splendor of an Unknown Empire.*** By Howard La Fay. Dec., 730-759
Wyeth Laboratories: Smallpox-vaccination needle **802,** 803
Wyoming: Aluminum ores 195, 201; Tight-sand gas deposits 648

Y

Yachts, aluminum 186, **202-203,** 203
Yakima, Wash. **614-615;** Agriculture-related business 610, 611, 614, 615; Mayor **614;** Population 610, 614
Yakima County, Wash.: Agricultural production, place in 610
Yakima Indian Nation, and Reservation, Wash.: ***Washington's Yakima Valley.*** By Mark Miller. Nov., 609-631
Area of reservation 610, 623-624
Cattle ranching 623, 625, 627
Caucasians on reservation **618, 619,** 624
Cultural disruption, effects of 610, 624, 627, 630-631
Economics 614, 618, 625, 627
Educational concerns 627, 630
Fishing rights 625
History: Land transactions with United States (1855, 1887) 624-625, social effects of 610, 624; Nomadic period 623, 624, 630
Map 614
Modernity, displays of **626**
Officials, reservation 623-624, 625, 627, **628**
Religion 630
Timber 618, 627
Tribal council 625; Chairman 627
Tribes forming nation, number of 623
Unemployment 627
Water rights 625; Litigation 625
Yakima Project (irrigation): Map 614
Yakima River, Wash. 609-610, **628-629;** Irrigation 610; Water, source of 609-610
Yakima Valley, Wash.: ***Washington's Yakima Valley.*** By Mark Miller. Nov., 609-631
Climate 610, 615, 620
Crops 610, 612, 615, 623; Apples 609, 610-611, **610-612,** 615, 617; Hops 617, 618, **620-621;** Mint 617; Production figures 610, 614, 617, 618
Desert 609, **630-631**
Labor force 609, 610, **611, 612,** 618-619, 623
Length of 624
Livestock center, state 610
Location 609
Map 614
Number of acres in production 610, 614
Population 610
Price of land (by acre) 615
Sheep raising 631, **631**
Soil, quality of 610
Water source 609-610, 614, 625; Irrigation canals **609,** 610
see also Yakima Indian Nation, *outlined*
Yale University: Dinosaur research 158, 176
Yallup, Bill 627
Yellow onions: Harvest **778-779**
Yellowstone Lake, Yellowstone National Park: Rangers 829, 838, 848, 849
Yellowstone National Park, U. S.: ***Winterkeeping in Yellowstone.*** By R. Steven Fuller. Dec., 829-857
Area 829
Avalanche prevention 856

Earthquakes 832
Map 830
Regulations 842
Thermal areas: Food sources 839; Geysers 839, **844, 845;** Hot springs **833,** 839, **843,** 845, 848; Insect life 845, 848; Moss growth 839, **845;** Mud pots 839, **857**
Visitors: Destruction by 845; Number of 856; Winter tours 830, 832, 849, 856
Weather 829, 830; Annual snowfall 829; Seasonal changes 829, 848, 856
Wildlife 829, 832, 839, 856; Bears 832, 835, 838, 856; Buffalo 829, **836-837,** 839, **847,** 856; Coyotes 839, 846, 856, bones **846;** Geysers threat to 839, **846;** Winterkill 839, 846, 856
Yellowstone Park Company 829
Yellowstone River, Yellowstone National Park, U. S. 829, 830, **840-841;** Grand Canyon of the 829, 832; Waterfalls 830
Yemen, People's Democratic Republic of 520
Yerkes, Robert and Ada 449
Yerkes Regional Primate Research Center, Atlanta, Ga. 451
Yesterday Lingers on Lake Erie's Bass Islands. By Terry and Lyntha Eiler. July, 86-101
Yorkshire (swine breed) **398-399, 404, 410**
Yost, Ed 860, 864-865, 870
Young, Gary **629**
Young, Gordon: ***Norway's Strategic Arctic Islands*** (Svalbard). Aug., 267-283
Young, Joseph **628**

Z

Zaharako Bros.: Columbus, Ind. **394**
Zamzam, Well of, Mecca, Saudi Arabia 585, 588, 597, 607, **607**
Zeballos, Luis 815
Zenobia, Queen (Palmyra) 350-351
Zeus (Greek god) 75
Zipper factory: Macon, Ga. 225
Zupan, Tim 436
Zwinger (museum), Dresden, East Germany 709, 711, 713-714

INDEXING STAFF

JOLENE M. BLOZIS *Chief*
MARTHA K. HIGHTOWER *Assistant Chief*
GEORGE I. BURNESTON, III
ANNE K. McCAIN
BRIT A. PETERSON
JESSICA C. TAYLOR
SARAH C. WERKHEISER